

# Australian Model Engineering

March-April  
1995

Issue 59

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**LOCOMOTIVES, TRACTION & STATIONARY ENGINES, BOATS,  
WORKSHOP, PRODUCTS, CLUB NEWS & EVENTS, REVIEWS**

**In This Issue:** ☒ Build a 5" g NSW Four-Wheeled S Wagon  
☒ Scale Horns for 5" gauge Diesel Locos  
☒ Expanding Boiler Tubes



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# Jigs & Fixtures

*A Great One by Colvin & Haas*

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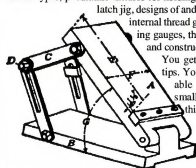
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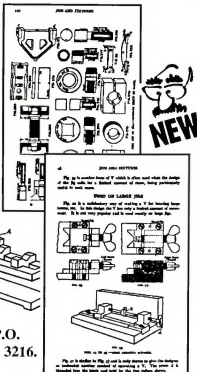
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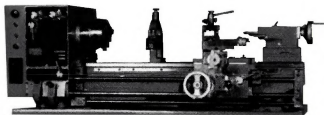
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**Friday 17 March 1995**

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### The Cover

*Apart from the overgrown foliage, this scene could be a siding on any country branch line in NSW. John Lyons' fabricated 5" gauge S wagons are a welcome addition to the growing list of scale wagons. Any version of the ubiquitous S wagon can be constructed from the story commencing on page 9.*

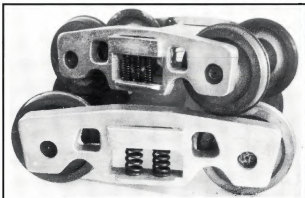
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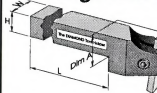
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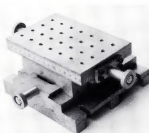
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## Comment

### The Big and the Small — should the twain meet?

In recently assuming the role of NSW representative for the Australian Association of Live Steamers (AALS), I have had a lesson in the difficulties of obtaining Public Liability Insurance. This has heightened my awareness of the need to be super-safety-conscious in all of our activities.

With today's trend towards larger engines — some narrow gauge 7½" gauge engines weigh up to one tonne and are capable of pulling many more tonnes — there is a genuine concern among the owners of smaller scale equipment for the safety of both persons and property when the running of these two drastically different sizes is combined.

Now before I am accused of bias, I have built and driven locos from 3½" gauge to large half-size 12" gauge locomotives. At present I have under consideration another largish 7½" gauge engine! However, in the interests of safety and everyone's enjoyment, I would urge club executives to consider separating the big and the small so that one doesn't limit the scope of the other.

"Keeping like with like" may be achieved by separate tracks, alternate running days, invitation runs specifically catering for large or small or in some other way that I haven't thought of yet. I do feel it is important to address this issue *before* there is an incident that could possibly ruin it for everyone.

Ultimately, I'd like to see the large-scale fraternity go their own way with larger rail, more suitable rolling stock and safety equipment, ending the limitations of operating on tracks intended for smaller engines and wagons. The Diamond Valley Railway (Victoria) is a marvellous example of what can be achieved.

If this issue concerns you, bring it up at your next club meeting; let's have some discussion with a view to improving the situation before it's too late!

*Ross Bishop-Wear*



### To our new reader

If this is your first issue of Australian Model Engineering, welcome! We hope you'll look forward to the ideas, news and camaraderie in each bi-monthly issue.

One of the great things about our hobby is the way model engineers actively help each other. Unless you live in an isolated community, you'll soon discover who has valuable experience in your field of interest, or who will help you to make a part that's too big for your workshop machinery. Look in the *Club Roundup* section to find a club that's near to you; visit the club and you'll usually find model engineers who live not too far away. Then you can experience the great fellowship that makes our hobby special.

This magazine is prepared in the same spirit of "model engineers helping each other". About two dozen people put many hundreds of hours work into each issue — all on a voluntary basis — to help model engineers in Australia and New Zealand keep up to date and keep in touch.

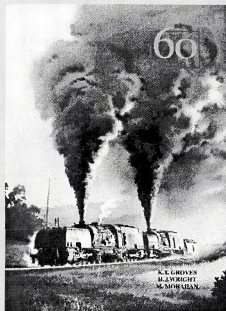
We rely on our readers to write articles for us — for the same (non-existent) rate of pay! If you have ideas or techniques that you feel would be interesting to others, please drop us a line. We'll gladly help with preparation of artwork or editing if that's necessary. Most important of all, please support the people who advertise in our magazine. Without them to pay the bills, you wouldn't be reading this!

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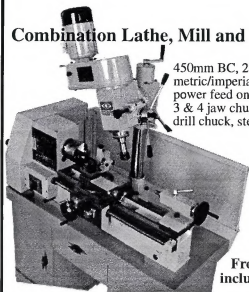
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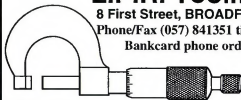
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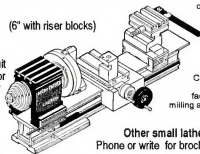


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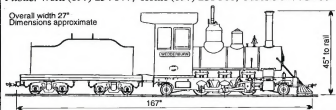
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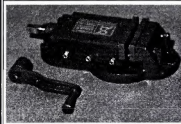
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# NSWGR S Wagons

Story and photos by John Lyons

*Model drawings for publication by Dave Adams*

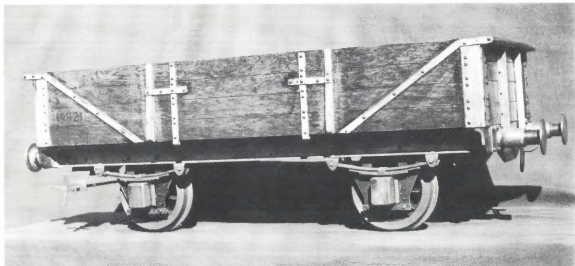
Some of us might remember when there was hardly a goods train or a goods siding without at least one or two four-wheeled S wagons present. It's good to remember them by re-creating them in miniature.

I set to work to fabricate at least a couple of NSWGR S wagons, and a four-wheeled HG guards van in 1/12 scale (5" gauge). A fellow club member decided to make an S wagon as well.

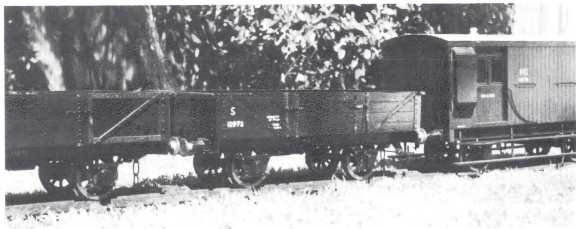
The standard 10-foot wheelbase chassis can be used as a basic structure for many NSWGR four-wheel wagons.

## The types

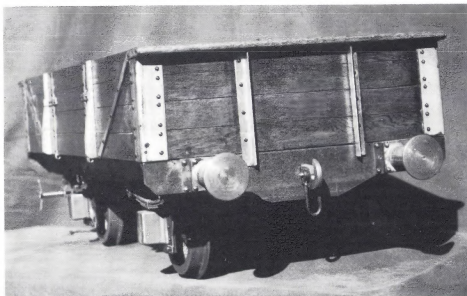
S wagons came in three varieties: timber, steel and composite. I think that with repairs there were some mixtures as well. It is only in some recent publications that I have seen photos of the steel wagons; the composite variety were the most common in the 1950s.



*The assembled S wagon just prior to painting. The metal fitting such as straps and corner angles are clearly seen in this timber version.*



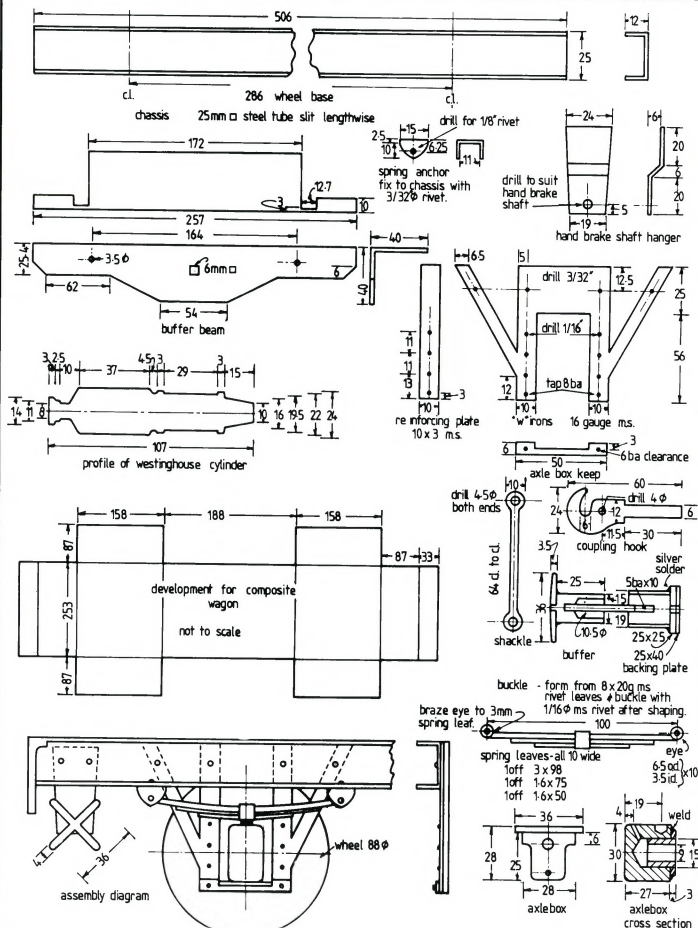
*The tail end of a pick-up goods waiting for the all-clear to proceed to the next job. This 5" gauge scene in the back yard adds to the flavour of modelling the steam era.*



*The end view of the S wagon. This view provides a few assembly clues. Note the side door posts, the position of the end angles, the coupling hook and shackle.*

The chassis members were made of 1" (25mm) square tube cut down the centre to give two channel pieces. They are slightly deeper than the correct size. The tube I used had a wall thickness of 1/16" (1.6mm). The buffer beams were cut from 40 x 40 x 3 mild steel angle. The W irons were cut from 16 gauge (1.6mm) plate (black mild steel) after marking out from a template.

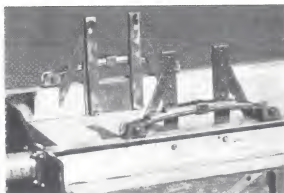
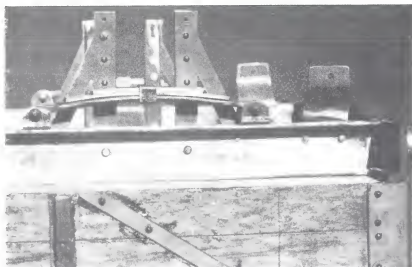
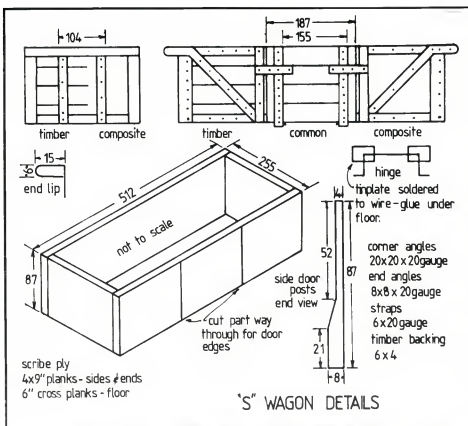
I stiffened the axlebox slots with pieces of 10 x 3 mild steel strip but I think that these could be done without, and allowances made in the buffer beam dimensions. I did not reinforce the W irons on my HG van model. The axleboxes were fabricated by welding a piece of 25 x 3 steel to the back of a piece of steel and machined in my shaper. The edges were rounded with an angle grinder then smoothed



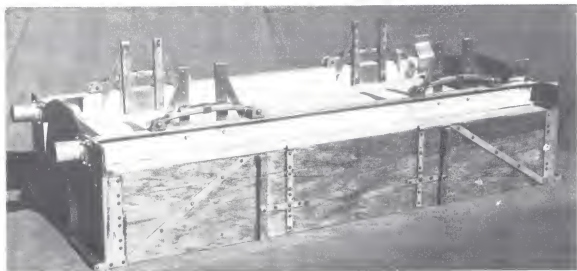
'S' WAGON COMPONENTS

with a file. They were drilled 15mm to take a brass bush for the axle journal and drilled on top for an oil hole and a hole for a rubber suspension cushion. I suppose a good idea would be to set up a pattern for, say, eight axleboxes in one stick to be cast in iron.

The reinforcing pieces were fitted with  $\frac{1}{16}$ " rivets; if you leave these pieces off you still need rivets for appearance. The holes for screws for the axlebox keeps are drilled No.50 for 8BA. The W irons were riveted to the chassis members with  $\frac{3}{32}$ " rivets. I made a jig that would take both sides at the one time with the insides facing up, i.e. channel down with the irons on top, mirror image to give RH and LH. The dummy springs were made and fitted to each chassis member before they were fitted to the buffer beams. They were made in sets of four by silver soldering four pieces of 10 x 3 mild steel to two 6mm diameter rods drilled  $\frac{1}{8}$ ". When cool, I separated them with a hacksaw. The slight curve was induced by hammering. The other leaves were cut from 16 gauge mild steel and the lot was held together with a strap of 20 gauge steel and a  $\frac{1}{16}$ " rivet. The spring anchors were bent in a set from 16 gauge mild steel, holes drilled then separated and shaped with a file. They were riveted to the chassis with  $\frac{3}{32}$ " rivets;  $\frac{1}{8}$ " rivets were used as the spring pins. The



*Above and left: a closer view of the W irons and spring mounting arrangement.*



brackets for the hand-brake shaft are fitted with  $\frac{3}{32}$ " rivets.

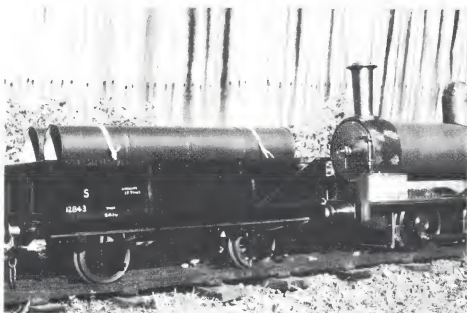
The buffers were fabricated from some heavy conduit I was lucky enough to have, 25 x 3 mild steel, 10 gauge plate and 16 gauge plate. I threaded lengths of 2mm nails 8BA cut them to suitable sizes and fitted 8BA nuts with loctite®. There are 40 per chassis; it is cheaper than using set screws. I found it was more convenient to put studs with nuts in the corners of the buffer backing

plates, making provision for the buffer stocks to be fitted to the backing plates but riveting the backing plates to the beams before assembly. It is much easier to tap the backing plate than the buffer beam. The buffer heads are in two parts, silver soldered then finished on the lathe. The buffer stock was in two pieces; also silver soldered and finished, drilled and cleaned on the lathe. The spring spindle was threaded 5 BA and secured with Loctite.

The chassis was assembled by brazing. The pieces were clamped upside down on a solid flat board with pieces of timber sitting through the axlebox slots to maintain alignment and squareness. When both ends were brazed the chassis was turned right side up and the top parts were then brazed. The coupling hooks were made from 6mm mild steel drilled and filed to shape. The measurements were taken from a full-size hook, probably from a four-wheeled coal wagon, drawn out full size, reduced and then a template made. The shackles were machined and filed from 10 x 3 mild steel; the other two links per coupling were made in a simple jig from some coat hanger wire that was about the correct scale size. The brake handles were made as cross-halved joints riveted and soft soldered, then, secured to a suitable rod fitted through the shaft hangers with Loctite.

### Timber tops

Sides and ends were 5mm marine ply suitably scribed to represent the planks, 4" x 9". The floor was 6mm exterior grade ply scribed for 6" floor boards. Sides were cut partly through to give the separation of door and sides. The strengthening posts on the sides of the doors were cut from pieces of pacific maple, as were the lips on the tops of the ends. All the timber components were assembled with panel pins and epoxy resin glue. The metal strapping and corner angles were cut from 20 gauge zinc-anneal. The vertical angles on the ends were formed from 20-gauge



*To top off your masterpiece, try using scale loads. Although the 19 class is still under construction, S wagons and 19 classes are just made for each other!*

aluminium. All metal parts were attached with contact adhesive and  $\frac{1}{16}$ " rivets; some were riveted over to hold things together but the majority were glued in place and trimmed flush on the inside. When cleaned up, the top was painted with five coats of shellac to seal and water-proof the timber. The top was attached to the chassis with four pop rivets.

### Wheels

Wheels are machined to AALS standards. I had some 10-spoke castings, courtesy of Ron Larkin, which are under the three S wagons. However, I liked the look of the 8-spoke wheels so I made a set of patterns and a local foundry produced the grey iron castings. I have only machined one set of 8-spoke wheels, which are under the HG van.

### Composite

The doors were made from individual planks of 5mm ply, glued on edge with the strap-hinges glued and riveted together. While I have drawn a development for a one-piece metal top I made the end pieces separate, pop riveting them to the ply floor. The floor is a piece of ply, again suitably scribed to represent the 6" floor boards. The straps, angles and door posts were as before; the timber packing pieces were sawn pacific maple. Contact adhesive and rivets held the lot together. The hollows at the top lips were filled with scrap timber and epoxy resin adhesive. The doors are supported by wire and tin plate hinges stuck under the floor with contact adhesive and have riveted straps at the top. It was good to be able to work from photos and measurements from the S wagon displayed in Parramatta Park; it's always handy if a full-size example is available.

The wagons are not museum pieces but at 10 metres on the track they do not look too bad, except they are too clean — I'm too young to have seen a new S wagon.

Happy building!

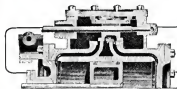
*We decided not to run a full prototype story on the S wagon because the Australian Model Railway Magazine has carried out a lot of research on this wagon. The results will be published in their April 1995 issue. Any NSWGR modeller would appreciate the efforts of the Australian Model Railway Magazine team on this project. Make sure you secure a copy!* bmc



*A rather well worn S wagon photographed at Parramatta Park. This is an example of the composite type and if you're a super-detailer, this photo will give some ideas for enhancing your model.*

**Relax with the smell of hot cutting oil!**





# Steam Chest

with Dave Harper

Greetings, and thanks to all the readers who have provided so much welcome feedback on this column! I've got comments on no less than three previous items that I think you'll find interesting, I'll take them in chronological order.

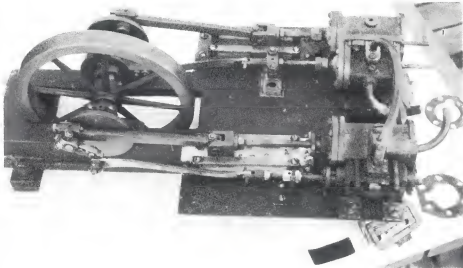
Firstly, in issue 56, Sept/Oct 94, on page 14 there was a picture of a horizontal steam engine driving a generator, taken at the Gympie Gold Mining Museum. I wondered who the maker was; well, Terry Paton from Gatton, and Dave Sampson from Bulimba in Brisbane both contacted me to say that the engine was manufactured by E. S. Hindley of Bourton in Dorset, England. Dave also told me that the generating set on board *ST Forceful* pictured on page 20 in issue 57 was also made by Hindley. What's more, he tells me that he has a collection of working miniature steam engines. I intend to see them in the near future, and photograph them to feature in this column.

Also in issue 57 (Nov/Dec '94) I asked for information regarding an old 4-2-0 model steam loco called *Marshall* at Queensland University. While to date nobody has been able to identify the model positively, general consensus from several sources has been that it is a free-lance model based on early long-boilered Stephenson types. It's definitely not a Crampton as the driving wheels are in front of the firebox, not behind as in Crampton's patent.

Colin Singer from Rockhampton phoned me to discuss the loco, and to tell me he has a very old book of loco drawings, dating back to 1850. Even better, he contrived to deliver the book to me over Christmas while he was down here visiting family. The book includes detailed drawings of a Crampton loco, so it confirms that argument! I'll have lots more to say about this book later, but I'd like to thank Colin for entrusting this book to me so that we can make use of it for the enlightenment of you, our readers!

Finally, on the loco *Marshall*, just the other day I discovered a photo of a 4-2-0 long-boilered Stephenson loco in O. S. Nock's book *Locomotion* (Routledge and Kegan Paul 1975). The same photo also turned up in Nock's *Steam Locomotive*, (Allen & Unwin 1968), where he states the loco is of the Southern Division of the Great North of England Railway in 1847. This style of loco was one of a number of unsuccessful branches in the story of loco development, and soon faded out of sight.

Back to feed-back: the odd vertical engine pictured and described on page 18 of the previous issue (No 58, Jan/Feb 95) has been the subject of considerable discussion. My regular



A twin horizontal mill engine with a number of unusual features.

correspondent Bob Ellis from Yanderra, NSW, suggested that the castings could have been from refrigeration control valves or something similar. He knows they work as he's used them himself! When I mentioned the odd valve gear to Neil Mackenzie, he immediately said "Oh, that's just like the valves on Westinghouse pumps!" I guess he should know, having made a number of them for his QR models! So there it is: looks like a couple of blokes had fun making the engine from whatever they could get their hands on. And as they worked at a hospital at the time, they'd have access to refrigeration parts.

## Raadschelders engine

That neatly brings me to the second engine of this collection of seven lent to the Qld Steam & Vintage Machinery Society's museum at Petrie, by Mike, son of the late Johan Raadschelders. The engines were built by Johan and his friend, an ex-naval engineer, in the 1950s.

I selected the largest one of the seven as several features on it had me puzzled. Having partially dismantled it to get an idea of "the works", I'm convinced that the builders were just amusing themselves! As can be seen from the photos, the engine is a twin horizontal mill-engine type with a number of unusual features.

Firstly, one cylinder has a bore of 1 inch and a piston valve, while the other has a bore of 1 1/8 inches and a slide valve! The piston valve is operated by a conventional eccentric, while the slide valve is driven from an over-hung crank on the end of the crankshaft!

Both pistons have slipper crossheads and bar guides, but one piston rod has a screwed

gland while the other has a clamped gland, likewise the valve rods. The stroke is 2" for both pistons (surprisingly!) As the slide valve and some of the cross head guides are of aluminium, this wasn't an engine designed for prolonged use.

The base casting is pretty substantial, but has obviously been "acquired" from some other purpose, as extensions are bolted on to support the cylinders.

A leaf spring fits behind the slide valve to ensure good contact of the valve face to the cylinder. There are open drain holes in both ends of each cylinder, and the engine is set up for inside admission and outside exhaust.

I'd say the builders certainly knew their stuff, and were just seeing what they could get away with, using whatever they could lay their hands on. And that's as good a reason to build a model steam engine as any!

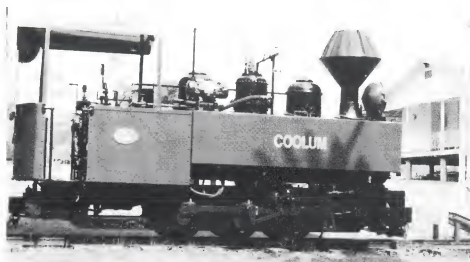
## A trip up the coast

I seem to have been on a steam-related jaunt for every issue lately, which is great for me, and hopefully interesting for you!

This time, it was another run with my mate Kel Ayling up to the Sunshine Coast hinterland where we had made contact with Clive Plater, who kindly invited us to visit his collection of cane train equipment.

His pride and joy is *Coolum*, a Fowler 0-6-0 that worked for many years at Moreton Sugar Mill, Nambour.

Sadly, *Coolum*'s boiler is beyond redemption, but the loco has been cosmetically restored, and looked a picture when Clive pushed it out into the sunshine for a photo session. With green paint work and red motion, *Coolum* is a very pretty loco. It also has



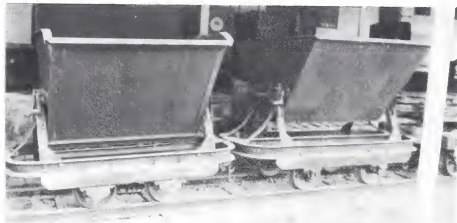
*Coolum, a Fowler 0-6-0 that worked for many years at Moreton Sugar Mill, Nambour.*

classic solid brass crosshead guides, which I'll come to in due course.

Among the interesting cane tram gear in Clive's immaculate set-up were a couple of old iron wagons that look just like the old chaldrons that used to run on the original English colliery tramways. They certainly look like the prototypes for the HOn3 ones I used to have!

Another "big model" feature was a pile of portable track which used to be laid into the cane fields at harvest time to get the wagons close to the cane cutters. Apart from the ramped pieces which were laid on the permanent track to form a crude junction, they look like overgrown Triang sections to me!

Kel tells me that similar, 3'6" gauge sectional track used to be laid to get new locos from Evans, Anderson & Phelan's works at Kangaroo Point, Brisbane all the way down Main St to the Woolloongabba Five-ways where the QR metals ran right across the intersection! A section of track was laid in front of the loco and it was steamed all the way, with gangs of men shifting the track as it went! There is a park now, where the works used to be. After a very pleasant few hours, we left feeling privileged to have seen Clive's amazing collection. Thanks, Clive!



*a couple of old iron wagons that look just like the old chaldrons that used to run on the original English colliery tramways.*

## A guide to crossheads

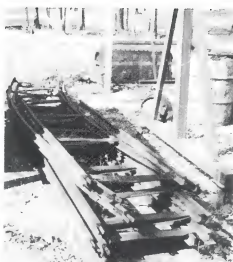
As promised in last issue, I have been diligently studying the subject of crossheads and their guides, and the way they have developed in nearly 300 years.

It was in 1712 that Thomas Newcomen installed his first atmospheric engine, at a Dudley colliery in Staffordshire, England.

The early engines had to be installed at collieries, as they used such prodigious amounts of coal to fire them that nobody but a colliery could afford them! Once their ability to pump water out of deep mines was proven, they were widely used in the Cornish tin and copper mines where they saved the miners from having to close the mines due to flooding. So, regardless of the cost of importing the coal, they remained in use in Cornwall right to the end.

Newcomen was the first of many engineers to be faced with the problem of getting the straight motion of a piston rod to operate a beam, the end of which moved in the arc of a circle.

His problem was simplified by the fact that the piston of an atmospheric engine only works on the downward stroke, as the piston is pushed down by atmospheric pressure due to the vacuum formed underneath by the con-



*A pile of portable track which used to be laid into the cane fields at harvest time to get the wagons close to the cane cutters.*

densation of the steam in the cylinder.

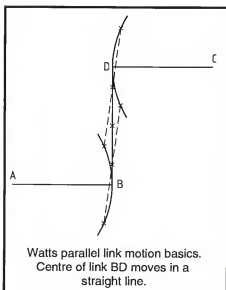
Thus he was able to connect the piston rod by a chain suspended from a quadrant on the inboard end of the beam. A similar arrangement at the outboard end carried the pump rods, the weight of which raised the piston at the end of each stroke.

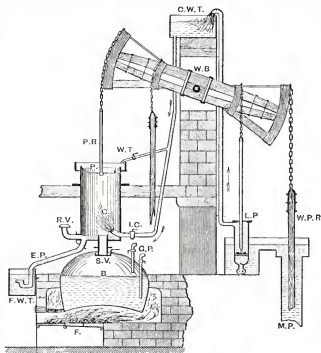
A very good description of these early engines is given in *The Pictorial History Of Steam Power*, by Van Riemsdick and Brown, Octopus Books 1980. The pictures reproduced here are from Professor Jamieson's *Elementary Manual of Steam and the Steam Engine*, eleventh edition, 1906.

This style of engine was built with only detailed improvements until 1769, when James Watt introduced his separate condenser.

However, it wasn't until Watt invented the double-acting steam engine in 1784 that he was faced with the problem of the piston pushing up on to the beam, which was difficult to do with a chain.

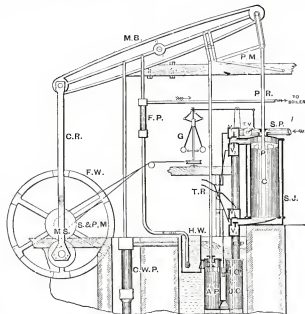
This led Watt to develop his famous paral-





NEWCOMEN'S ATMOSPHERIC ENGINE, 1712.

F	for Furnace.	MP	for Mine pump.
B	Boiler.	I.P.	for Lift pump.
GP	Gauge pipes.	C.W.T.	Cold-water tank.
S.V.	Steam valve.	W.T.	Water tap to top of piston.
C	Cylinder.	I.C.	Injection cock.
P	Piston.	R.V.	Relief or snifting valve.
P.R.	Piston rod.	E.P.	Ejection pipe.
W.B.	Wooden beam.	F.W.T.	Feed-water tank.
W.P.R.	Weighted pump rod.		



WATT'S DOUBLE-ACTING ENGINE, 1784.

SP	for Steam pipe.	H	for Handle.
TV	Throttle valve.	AP	Air pump.
G	Governor.	HW	Hot well.
V <sub>1</sub> V <sub>2</sub>	Steam valves connected by a pipe.	FP	Feed pump.
V <sub>3</sub> V <sub>4</sub>	Exhaust valves also connected by a pipe.	CWP	Cold-water pump.
TR	Tappet (or plug) rod.	P	Piston.
C	Cylinder.	PR	Piston rod.
SJ	Steam jacket.	PM	Parallel motion.
EP	Exhaust pipe.	MB	Metal beam.
JC	Jet condenser (separate).	CR	Connecting rod.
IC	Injection cock.	S & P M	Sun and planet motion.
		MS	Main shaft.
		FW	Fly-wheel.

lel link motion, which he claimed was one of his favourite inventions, being such an elegant solution to the problem.

The problem faced by these early engineers was that they had no mechanical means to produce sliding faces, only chisels and files. It wasn't until Maudsley and Nasmyth introduced parallel and shaping machines in the 1820s that such devices became practical propositions.

The parallel link motion is a very simple idea. Watt reasoned that if the end of a lever follows the path of an arc of a circle, if a second similar lever were placed above the first, and the ends were connected by a link, then the centre of the link should follow a perfectly straight line. The figure should make this clear. All the variations of the parallel link follow this simple geometric truth.

The radius links merely guide the piston rod, pump rod, etc. Large forged links actually transmit the power. A study of the drawing of Watt's 1784 double-acting engine will show how he used the links for the air pump as well as the main piston rod.

The same methods were used on the early locomotives, until the idea of rod guides was developed. This again had to wait until smooth rods could be manufactured!

More of that next time.

Until then, happy steaming!



## You know you're a Modelling Nut when...

- You find you have to be reminded three times when to eat.
- Your subscription to *Playboy* expires and you don't really care.
- You plan your holiday stops according to where the good train clubs are.
- You no longer admire the blondes on magazine covers, just what they're holding.
- You find you have forgotten how to start your lawnmower.
- You quit trying to make a Grant Batty out of your son but an Engineer instead.
- You buy your wife a set of castings for her birthday, and celebrate your anniversary by spending the day at the local train track.
- Your only interest in going all the way to the USA and seeing Dis-

neyland is because most of the stuff is proportionally controlled.

## You know you're a Modelling Nut's wife when...

- You can never find your scissors, pins, waxed paper or knitting machine weights.
- You find yourself on the roof adjusting the TV antenna on your own.
- You can stop wondering what to get hubby for Christmas... he's already sent away for some castings.
- So many men enter your back door in the evening that the neighbours are looking at you funny.
- Your house smells funny, and you've quit making excuses for it.
- You make a concentrated effort to beat him to the newsletter when the mail comes.



with Dave Harper

This is a column, for discussing books and other printed matter of interest to our readers. I am an avid collector of old books on engineering history, as well as the odd new ones that appear from time to time. I believe there are many others who also read books as well as micrometers!

So, here's your chance to tell us about that you-beaut book you've just found, or to ask for information on any relevant (to AME) subject that someone may have in a book. Our regular advertisers, Plough Book Sales and Camden Books, have an amazing array of books, and the odd review in this column of books obtained from them will be of interest I'm sure.

For this first review, however, I'd like to review a book that's harder to acquire than calling Camden or Plough. It's the book

mentioned in Steam Chest, which was recently lent to me by Colin Singer of Rockhampton. Thomas Tredgold apparently produced a number of publications about railway matters between 1825 and 1850. This book appears to be a collection of ten papers bound together into one volume. It is a beautifully bound volume approximately 13" x 10" by nearly 2" thick, and was published by John Weale, 59 High Holborn, London in 1850. Colin rescued this book when it was being tossed out from a government department.

The ten papers are as follows:

1. Rules and regulations for the practical management of a locomotive engine by Mr John Sewell, illustrated with five engravings of *The Iron Duke* 8-wheeler of the GWR, and three engravings of GWR's goods loco *Pyracmon*. The engravings, incidentally, fold out to be about 36" long x 12" high.

2. Description of Mr Samuel's express engine with three engravings.

3. Mr Armstrong on 'The Dimensions of the Locomotive Engine Boiler'.

4. Mr H. B. Barlow's description of Messrs Sharpe Brothers & Co's outside cylinder tank engine, with five engravings.

5. Mr Woods on *Consumption of fuel and the evaporation of water* with two engravings.

6. Mr R. Stephenson & Co's description of the previous patented locomotive with four engravings. This, for me, is the jewel in the crown. The description runs for over 60 pages and the engravings are detailed enough to build a model from. It is an early 2-2-2 loco with gab valve gear.

7. Mr Tayleur's specification and duties of the passenger engines on the Caledonian Railway, with six engravings.

8. Messrs Bury Curtis & Kennedy's description of the passenger locomotive *Wrekin* with four engravings.

9. Messrs R. & W. Hawthorne's description of the locomotive engine *Plews* and tender, made for speed. With four engravings.

10. Mr Crampton's description of his patented locomotive made to equal the duty of the Great Western Railway's locos. With four engravings.

To say that I got pretty excited when I first saw the book would be an understatement! To have such detailed information from the early days of loco development available is rare enough, but to be asked to pass it on to interested readers is a real bonus!

Meantime, feel free to contact me either direct or via the editor, and tell me if you're interested, and if you have anything you'd like to contribute to this column.



## An Invitation to the 7th Australian Miniature Traction Engine Rally Inverell Pioneer Village

21-22 October 1995

by Gordon Blake

To hold a successful rally the most necessary ingredient is engines and plenty of them, but to attract a lot of engines you must have good organization and a good venue at

which to hold your rally. Well the organizing is yet to be proven but our venue has already proven itself. The Inverell Pioneer Village, situated on the southern side of Inverell is, I believe, a near perfect place to hold a rally of this type.

The village, a museum in its own right, is made up of a collection of about 25 authentic homes and buildings dating back to the 1840s that have been relocated from their original site and fitted-out with the relevant furniture, fittings, etc. pertaining to each building.

There are homesteads, a pub, country halls, a newspaper and printing office, machinery, steam engines, a gem and stone collection,

RSL War Museum, shops and a dentist surgery. Plenty to see and do while hubby is driving his engine around the village pond. The traction engine track is a pleasant gravel road among the trees and buildings.

Getting back to the rally, it could almost be a Cliff and Bunting rally, at this stage Bob White and I have an engine each nearing completion, Andy McLeod's and my

first Cliff and Bunting, which now belongs to Vic Sicluna, will hopefully be in attendance. There are 119 engines on the register, compiled by Kellie Dew of the Mooroolbark Club. These will receive an invitation, others wishing to attend and are not sure if they are on the register or perhaps do not wish to be on the register and still wish to attend can contact Bob White or myself for details. The list indicates that about fifty engine owners are a day's drive or less from Inverell, it is wonderful if that many turned up! My mind boggles just thinking about it. Fifty is probably not a lot compared to the English rally scene, which also raises another question, what is the largest number of model traction engines to attend a single rally in Australia? Hopefully we can set a record, and by doing so, furnish all traction engine enthusiasts with a very good time and a very pleasant week-end in October, 1995.

The rally is open to models — all scales — of traction engines, portables, rollers, steam wagons, implements and accessories, either complete or partly built. Partly built or small items for static display will be arranged under cover or in the Oakwood Hall. By the way, since the village has a delightful little pond surrounded by green grass and shady trees, a few model boat enthusiasts may like a week-end out and enjoy the surroundings at Inverell also. For further information contact:

Bob White, Ph. (067) 22 1569

Gordon Blake, Ph. (067) 22 4272



Ken Chappel driving a Cliff and Bunting at Inverell Pioneer Village on Australia day 1992.



# Horns for 5" gauge Diesel Locomotives

Barry Glover describes one way of manufacturing suitable hornsets

*Drawings for publication by John Hill and Neil Graham. Photos by Barry Glover and Neil Graham*

A phone call from our Editor brought a request to come up with a set of air horns for the 422 which looked the part. These are five-chime air horns located above each cab. Works drawings were unobtainable, so a trip to the local depot resulted in a long face and much thinking on how to tackle what first appeared to be a very simple project, but which, in the end consumed more time than most of the major components for the loco.

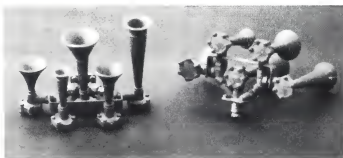
The five-chime hornset for the 422 class is representative of all the early NSWGR diesels. However, many horns from hood units (42, 421 and 44 classes) were later reduced to two-chime units. The units about to be described would also be suitable for most VR and SAR diesels.

## What's needed

Eventually it was decided that the only practical way to produce the horns was to start with "lost wax" castings. The kit (available from Scobie & Glover Sheetmetal) comprises five trumpet horns and a combined manifold/base. One kit is required for each end of the locomotive. Some machining operations are required, so we need to manufacture some simple jigs to hold the rather complex shapes. You will also need a scrap piece of 0.5mm brass and 8BA screws and nuts.

## The jig

The various components of the air horn set are held together by 8BA studs. It is therefore necessary to hold the component steady while



*The completed hornset ready to be fitted to a locomotive*

drilling the tapping size holes (No. 50). The Body Jig is made from 1/2" square (nominal) mild steel as per Detail 1. Square off both ends so that it will sit square and upright when put in a machine vice. The dimensions shown are approximate and the recess in the block is only there to allow the Wedge (Detail 3) to fit through and support the body of the casting. The Drill Bush (Detail 2) wants to be a nice sliding fit in the 1/4" reamed hole. Before drilling the 3/32" (No. 32) holes check the body diameter and the casting sprue diameter to ensure that they will fit into the Bush. Provided the clearance is not more than 0.008", all should be okay. If necessary, cut the sprues back on all the castings to a suitable length, make sure the end is square and check-fit all into the Drill Bush before hardening. Take a piece of 1/4" square mild steel and set it on a 1 to 1.5 degree taper packing piece. Machine the taper approximately 1" long.

## Using the jig

To use the jig, insert the Drill Bush in the Body Jig. Place in the machine vice and locate

under a No. 50 drill in either the milling machine or drill press. Lock all clamps when satisfied that the Bush is centralised. Fit the sprue and Body of the first unit in to the underside of the Drill Bush, push home in the body and lock the 6BA screw in. Slide the Wedge on the underside of the Body and the unit should be held firmly in the jig. Drill down into the Body, being careful not to go too far in (we don't want a hole out the other side).

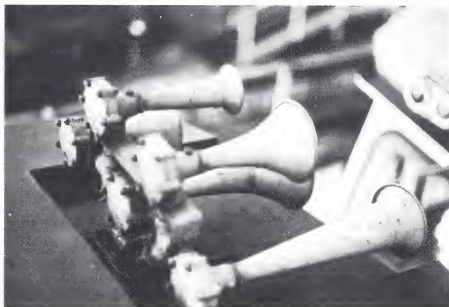
Repeat for the remaining seven body/trumpet units. Note that the remaining two castings are for body units only (i.e. the trumpets are separate). Place the body unit vertically in the jig and drill down No. 50. Don't go too deep and out the bottom of the casting. Tap all holes 8BA.

## Manifold and horn base jig

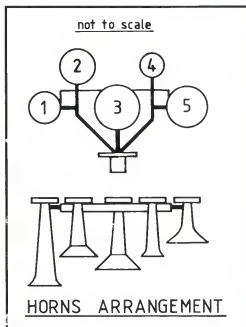
The base jig as shown in Detail 4 requires a piece of hexagonal brass approximately 1/2" AF. Check the spigot diameter on the Manifold castings, then centre and drill through the appropriate diameter (approximately 7/32") and part off 1/2" long after counter-sinking deep enough for a horn body to sit in flush. Now run a hack-saw down through one of the corners into the bore. Clean off any burrs.

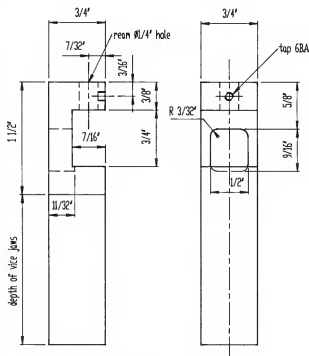
## Operations

Place a casting in the jig then hold it firm in the 3-jaw chuck. Carefully centre with a small centre drill and drill through 3/32" diameter. Repeat for the second casting. Trans-

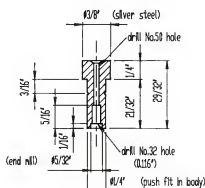


*The Horn cluster on locomotive 42220, on shed at Port Kembla for maintenance*

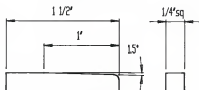




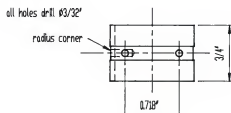
① BODY JIG



② DRILL BUSH

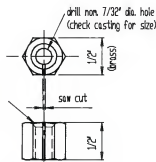


③ WEDGE

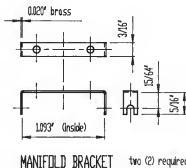


⑤ MANIFOLD BRACKET JIG

c'sk top so that casting sits flat on top of face



④ MANIFOLD JIG



MANIFOLD BRACKET two (2) required

fer to the drill or the machine vice on the milling machine.

The next operation can be done on the drill, but I would advise using the mill for this operation. Set up the jig to suitable height with the top just above jaw level using suitable parallels. Put the No. 50 drill in the drill chuck or collet and set the Manifold up both

square in the vertical axis and parallel in the horizontal axis. When satisfied, centre over one arm and drill down to maximum depth available. Traverse to the next arm, check centring and repeat.

Relocate the jig through 90 degrees near the edge of the vice. Line up the two side spigots in the vertical plane, centre over the

spigot and drill into previous hole. Rotate through 180 degrees, line up and repeat as for the other side. Repeat these operations for the second Manifold and tap all holes BBA.

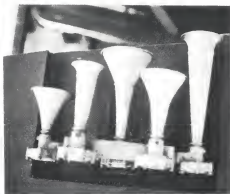
## The manifold bracket jig

The Manifold Bracket jig (Detail 5) is the next item, so cut another piece of 3/4" square. If using black bar, machine on three faces minimum, square and parallel. Square off one end then machine to an overall length of 1.113". On this face take another cut 1/16" deep across the face 5/16" down from the top edge. Put a new 3/16" slot drill in the collet, reset the block so the top face is uppermost and sitting nicely on the parallels. Position the cutter somewhere near the centre of the block, pick up the face with the cutter and take a cut 0.010" down the length of the block. Make sure the cross slide is locked, as we don't want to move this for a while yet. Up-end the block, set up square and vertical, making sure you keep the same face to the fixed jaw, and take another cut 0.010" deep across the end. Repeat for the other end. Clean off any burrs and with a needle file put approximately 0.010" radius on the corners where our Manifold Bracket will bend around.

Put up the drill chuck in the mill and put in a small centre drill. Check the centre distance of the tapped holes on the Manifold casting and mark this out on the jig (approximate centres 2 3/32"). On the stepped end of the jig, scribe a

line across the groove 1 5/64" + 0.010" down from the top face.

Set up the jig in the vice, locate the centre drill over one of the marks, centre and drill 3/32" diameter some 1/4" deep. Traverse to the next hole and repeat. Up-end the jig, centre and drill the end hole.



Looking down on 42220's hornset

## Making the manifold bracket

Cut two pieces of 0.020" brass shim  $\frac{3}{16}$ " wide by 2" long. Machine, file, etc., to a nice fit in the groove machined in the jig. Fold both pieces around the jig.

Back to the machine vice with the jig: put down on parallels and locate the  $\frac{3}{32}$ " diameter drill in one of the holes. Set the stop, traverse to the next hole, locate and set the other stop. Place the Bracket back in the jig, centre drill and follow with  $\frac{3}{32}$ " diameter for the first hole, traverse to the other stop and repeat. Place the second Bracket in the jig and repeat operations again. Stand the jig on end and locate the end hole with a  $\frac{3}{32}$ " drill. In with a Bracket again and drill the  $\frac{3}{32}$ " diameter hole in the Bracket ends. It will probably be necessary to hold the Bracket in the grooves using a small toolmaker's clamp. If the end piece tends to rise up, use a small screwdriver or similar to hold it down in the groove while being drilled. Clean up any burrs and back into the jig where the jeweller's saw or similar is used to cut off the excess length of the legs. Trim the length to the step machine in one end and finally open out these two holes as per the drawing.

## Preparing the fasteners

Take eight standard 8BA nuts (brass for preference) and 10 x  $\frac{1}{8}$ " AF as supplied by model engineer suppliers. These will be steel. If they are not available, tap out a 10BA nut to 8BA.

Cut the head off an 8BA x  $\frac{1}{2}$ " long (or longer) steel screw and grab in the 3-jaw with about 6mm projecting. Measure the height of

a steel Nut and machine all Nuts to half height using the stub as a mandrel. Take two of the  $\frac{1}{8}$ " AF thin nuts and drill out  $\frac{3}{32}$ " diameter — or if you have any  $\frac{1}{8}$ " AF hexagon bar, drill down  $\frac{3}{32}$ " diameter and part off two slices the same thickness as the Nuts.

Make up a "thin" spanner to fit the smaller Nuts. This needs to be just thinner than the thickness of the Nuts. Make sure it is a nice fit; use stainless steel for preference as it gives a bit more strength around the jaws.

## No. 2 trumpet

In the bag of castings we still have two trumpets which so far have remained untouched. Place them in the lathe so that the bell mouth runs nice and true. With a small centre drill, centre then drill right through No. 50. Tap 8BA at least 20mm deep from the face of the Trumpet. Part off at the junction of the trumpet and the chucking piece.

Cut a couple of pieces of 8BA studding and screw into the end of the separate Bodies you have previously machined. Screw on the Trumpets for a trial fit into the Body. If okay, remove and place to one side.

## Assembly

To assemble the horn cluster, we begin by cutting four lengths of 8BA screwed rod (use 8BA set screws, cut off about  $\frac{1}{4}$ ") Screw these into the four tapped holes in the manifold, say finger tight. Referring to Detail 6 on the two horizontal studs, screw on one of the thin  $\frac{1}{8}$ " AF nuts. On the vertical studs, screw on one of the standard 8BA thin nuts. Then lock the standard thin nut on to the manifold. Screw the remaining  $\frac{1}{8}$ " AF thin nuts on to these two studs.

Place the Manifold Bracket in position over the studs. Level up horizontally by adjusting the two vertical  $\frac{1}{8}$ " AF thin nuts. Use the special spanners, previously described, on these thin nuts.

Take Trumpet No. 3, slip an 8BA screw up through the spigot, slip over one of the drilled-out small hex sleeves and screw the Trumpet to the Body. Check that it is square in all planes. You might find it easier for the rest of the assembly to place the fitting back in the Manifold jig and hold it in a vice. You can now fit Trumpets Nos. 1, 4 and 5. Screw on until they come against the Manifold Bracket or as close as you can get it, with the legs on the Bracket still remaining square (a bit of fiddling with the stud length and nut height may be required here). When satisfied, lock up the Body using the special "thin" spanner. Finally, screw on the Trumpet

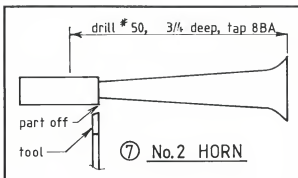
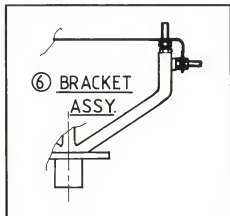


Two views of the lost wax cast horn set suitable for most classes of NSW, VR and some SAR and Commonwealth Railways diesels

for No. 2 Horn line up square and parallel and tighten the Lock Nut. We now have a fairly close replica of the horn set on a 422 class locomotive.

Now that you have them all looking "Mickey Mouse", pull them apart and store them without mixing up the pieces.

Clean the pieces thoroughly using thinners or other evaporative cleaning solvent. Re-assemble using Loctite® 406 (or equivalent) to fix things in place permanently. Leave for a few days to effect a permanent cure. Before painting, wash thoroughly in thinners and use a good quality etch primer undercoat, such as Hols automotive spray cans No. PS-106, grey primer.





# Club Roundup

## Coming Events

**24 to 26 March**

**Hare & Forbes Brisbane: workshop machinery sale.**

See News Desk for details.

**1 April**

**Western Port Vic**

BHP Western Port Railway Society extends an invitation to their "All-comers day". Clubs will be contacted during February with details. Enquiries: Lois Carter, BHPWPRS, Publicity Officer, Bag 1, PO, Hastings, 3915

**14 to 17 April**

**AALS Convention**

At Townsville Qld. Enquiries to: Convention Secretary, Laurie Fielder PO Box 90, Hyde Park, Qld, 4812 Phone (077) 88 8200, Fax (077) 88 8318

**Easter Weekend**

**Invitation - Gore NZ**

All clubs are invited to the opening of the club-rooms and raised track. They are hosting the Easter Meet and the first steam trials of the South Island Association of Model Engineers.

**Gore Model Engineering Club Inc.**  
Contact: G. Head (NZ) 208 5001

**4 to 7 May**

**Hare & Forbes Parramatta: workshop machinery sale.**

See News Desk for details.

**6 and 7 May**

**Invitation run - Mackay Qld**

Just four hours south of Townsville. Join them on the May Day weekend. All convention travellers are welcome to drop in for a run any time. Contact: Col Etwell (079) 52 2401 or Len Heaton (079) 59 2169

**21 May**

**Annual boating regatta - Galston**

The Hornsby & District Model Engineers invite all model mariners to Fagan Park for a fun day on the pond. Contact Alan Fern (02) 639 8173 for details.

**27 May**

**AALS Invitation run - Galston**

The Hornsby & District Model Engineers invite all Model Engineers to their Galston Valley Railway, Mid Dural Rd Galston NSW. Contact the Hon Secretary (02) 872 5173 for further information.

**10 to 12 June**

**Winter run in Wollongong**

See this page for details.

## Mudgee NSW

The last three months has seen work progressing on the installation of a generator set driven by an old restored single-cylinder Ronaldson & Tippet diesel engine, together with underground cable to provide the track site with 240v power and lighting. This should make life a lot easier for all concerned when setting up for weekend runs etc.

The effects of the drought were brought home to all of us when our only source of water supply, a 40,000 gallon tank, ran dry in early November. Luckily a couple of heavy downpours over Christmas have given us some reprieve for the time being, with the hope of more rain to come in the near future. Plans are well in hand for this year's *Blowfly* rally; the club will be advising the exact date in the near future. Please address all correspondence to: Max Murphy, 47 George St, Mudgee 2850; Ph (063) 722009

**Mudgee Miniature Railway Co-Op Society Ltd.**  
**Location:** Cnr of Cassilis Rd and Buckeroo Lane, Mudgee  
**Public running days:** second Sunday of the month.

## Mackay Qld

Club members were looking forward to the end of a successful and busy year, with the prospect of more hours to progress with personal model engineering projects and the additional club track facilities. However, we had a dampener put on this by some "\*\*\*\*\*" person or persons who thought our efforts to restore the old Farleigh Railway Station for our club house would give them a thrill by setting fire to it. However, with the inevitable club spirit, on the Saturday prior to the end-of-year run and barbecue, members pulled together in an effort to clear away debris and to make safe the remnants of the clubhouse. In spite of this setback, members still had a very enjoyable Christmas breakup barbecue.

The damage to the clubhouse also serves as a reminder to other clubs to ensure appropriate insurance cover is kept.

The running days for the club have changed. Now it's the first Sunday of each month from 2pm till 4pm (it's a lot easier to remember this time).

All club members are looking forward to seeing fellow modellers on or about the Easter weekend or at the annual May Day weekend run. Please address all correspondence to: Mackay Society of Model Engineers, PO Box 5267, Mackay Mail Centre Mackay Qld. 4740

**Mackay Society of Model Engineers**

**Location:** Muller Park, Mackay

**Public running days:** first Sunday of each month

## Casino NSW

One of our founding members and former liaison officer Graham Vause passed away suddenly on 6th January 1995. Graham was the proud owner builder of a *Marie Estelle* 7 1/4" gauge loco. Graham was in the process of making an *Atlantic* in 7 1/4" gauge with the running gear complete and the copper boiler near completion. He will be sadly missed.

Some activities over the past four months were the Anniversary run in October, which was patronized very well over the weekend. Special thanks to Brian Holden and crew from the Hornsby and Districts Model Engineers and Eddie Harper from Blaxland who made the long trip for the run. They enjoyed the night running with a 2.30am finish.

On the November run members operated two 7 1/4" steam locos, a *Mogul*, a *Prairie* and a 40 class diesel. That particular day the track was the destination of the Ulysses Motor Bike Club of the Northern Rivers Area. They came from Tweed Heads, Byron Bay, Ballina, Grafton and Coffs Harbour, and from their comments they enjoyed the mini train ride and visit to Old Casino Station Museum.

The Christmas run and a family barbecue was held on 17 December for club members. With a visiting locomotive from Coffs Harbour and one from the Gold Coast, in all five steam engines and one diesel operated well into the night.

The Society has continued to grow in membership and patronage in spite of some very hot weather.

**Bernie Childs.** (PCRSI liaison officer)

**Pacific Coast Railway Society Inc.**

**Location:** Cnr West and Queensland Sts, Casino.

**Public running day:** first Saturday and third Sunday of each month.

## Warner Qld

Oops! I've done it again, my apologies to the QSMEE for indicating in the last issue that this society operated public running days...bmc

**Queensland Society of Model and Experimental Engineers Inc.**

**Location:** Warner Rd, Warner

**NO PUBLIC RUNNING DAYS!**

## Wollongong NSW

You are warmly invited to the inaugural *Winter Weekend in Wonderful Wollongong*.

The Illawarra Live Steamers are having a steam-up over the 10 - 12 June long weekend at their track. For those who attended the Easter Convention (1994), it will be an excellent opportunity to run once more on one of the best 5" gauge tracks in the country. The facilities have been expanded even further with new strategic cross-overs, additional passing



loops and several new sidings in out-of-the-way locations to offer challenging operations.

Bringing along as much motive power and rolling stock as you can carry! You can try your hand at realistic railway operation or just have fun! There will be a few novelty events for those who enjoy light-hearted competition.

Regardless of the weather, bring a warm jumper — it's never freezing at the 'Gong but it may get cool. Don't forget your boiler certificate and if applicable, night running gear, and a desire to have the most fun possible with your overalls on!

Invitations with more details will be forwarded to club secretaries closer to the time; meanwhile mark the dates in your diary. Enquiries may be directed to the club at 63 Pioneer Rd, Bellambi, 2518.

#### **Illawarra Live Steamers Co-Op Ltd.**

**Location:** Stuart Park, Virginia St, North Wollongong

**Public running day:** fourth Sunday of each month.

#### **Prospect SA**

The club has seen some major projects completed over the last twelve months: two boundary fences renewed, extensions to power and water supplies to the eastern ends of the grounds, and a new truck shed. The erection of a large fixed verandah to the clubhouse, plus quite a bit of track re-sleeper has been undertaken. Public attendances at the field days are as unpredictable as the weather.

An interesting sideline to running trains has proven to be Don Osborne's steam traction engine coupled to wood-sawing and coal-crushing machinery. This gives the general public an insight into the ways of old. A fenced-off area has now been set up for showing model stationary engines in operation. Stationary engines seem popular these days.

#### **The Adelaide Miniature Steam Railway Society Inc.**

**Location:** 370 Regency Rd, Prospect

**Public running day:** fourth Sunday of each month.

#### **Castledare WA**

The railway is enjoying continuing success all the Christmas functions were completely booked out. However, the extra finances were short-lived, with untimely breakdowns of railway maintenance plant and equipment. The Castledare club is not alone in the fight to get members to take part in that four-letter-word — WORK! Now they are trying free lunches to entice members to help out.

The club is adopting a uniform method of braking trains. The standard involves the use of a "proven and well tried fail safe vacuum operated system." Details will be available in the near future. Compliance date has been set at 1 January 1997.

#### **Castledare Miniature Railways of WA inc.**

**Location:** Rear 100 Fern Rd, Wilson

**Public running day:** first Sunday of each month.

#### **Auckland NZ**

1994 was a successful year with many projects at or near completion. The new club electric loco was commissioned and is now proving a great asset to the club. The signals, now in working order, have been modified to prevent the sensors from being stolen.

#### **The Auckland Society of Model Engineers Inc.**

**Location:** Petersens reserve, Panmure

**Public Running day:** first Sunday of each month.

#### **Edgeworth NSW**

Work is under way replacing the deck on Civill Bridge; the well-worn timber is being replaced with steel plates. The Nooroo signal box has had attention from unwanted visitors; fortunately there wasn't any damage, but the door has been strengthened to make sure. A concern in the club is the problem of attracting younger members, although the oldies are still most welcome! [Certainly worth thinking about; it seems to be the same with all clubs. If you find the answer I'm sure we would all benefit... bmc].

#### **Lake Macquarie Live Steam Locomotive Co-Op Society Ltd.**

**Location:** off Velinda St, Edgeworth

**Public running day:** last Sunday of each month

#### **Maryborough Qld**

Last year's Spring Festival was an enjoyable occasion with fine weather and fine company. Two competitions were held. The D. & M. Kuskie award for a completed model was won by Eric Abbott for his 2" scale Clayton under-type steam wagon. There were six entries in this category. The second competition comprising nine entries for the Lynton McWatters Memorial award for models under construction was won by Alan Wilson for his 3½" gauge NSWGR 38 class loco. Apparently the judges had a difficult time due to the high standard of workmanship. Ken Sanders submitted a most unusual loco in the latter award. His Rocket Kensington loco is fitted with Stephenson's valve gear on one side and Walschaerts' valve gear on the other! It should prove an interesting performer when it is complete.

As well as competition entries, there were other part-built models on display, including a Torquay Manor (K. Moffett), and a Hexham Colliery (ex ROD) 2-8-0 (R. Kimber). Also on display was a completed 3" scale naval deck gun by D. Jones.

#### **Model Engineers and Live Steamers' Association Maryborough Inc.**

**Location:** Queens Park, Maryborough

**Public running day:** last Sunday of each month.

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next to personal contact,  
the best way to keep in touch!

#### **Bunbury WA**

**South West Model Engineers Association WA Inc.**

**Location:** Forrest Park, Bunbury

**Public running day:** third Sunday of each month.

#### **Eltham Vic**

**Diamond Valley Railway Inc.**

**Location:** Eltham Lower Park, Eltham

**Public running day:** every Sunday

#### **Wodonga Vic**

**Lake Hume Model Engineers Inc.**

**Location:** Diamond Park, Wodonga

**Public running day:** third Sunday of each month.

#### **Port Augusta SA**

**Port Augusta Model Engineers Inc.**

**Location:** Elsie St, Port Augusta

**Public running day:** third Sunday of each month.

#### **Carina Qld**

**Brisbane Live Steamers & Model Engineering Society Inc.**

**Location:** Railway Park, Fursden Rd, Carina

**Public running day:** first and last Sundays of each month.

#### **Altona Vic**

**Altona South Western Railroad Inc.**

**Location:** Blenheim Rd, Altona

**Public running day:** third Sunday of each month.

#### **Canberra ACT**

**Canberra Society of Model and Experimental Engineers Inc.**

**Location:** Geijera Place, Kingston

**Public running day:** last Sunday of each month.

#### **Wagga Wagga NSW**

**Wagga Wagga Society of Model Engineers Co-Op Ltd.**

**Location:** Botanic Gardens, Willans Hill

**Public running day:** first and third Sundays of each month.

#### **Club Roundup contributions**

AME is pleased to receive club newsletters for consideration in this section. Newsletters are often a good source of articles, which we appreciate all the more, but most of all they help us keep in touch.

It is often difficult to decide what to publish and what to leave out, and the task of selecting material for a wider audience takes a lot of time. Also, there is always the risk that AME will publish something that the club considers sensitive. Please help by sending a "press release" page with your newsletter, or highlight the items you think we could use. We'll give first preference to clubs that help us out this way.

bmc

# QSMEE Trophy Day

Story and photos by Tom Hulse

There were two reasons to celebrate at the Queensland Society of Model and Experimental Engineers' 1994 Trophy Day. First was the opening of the extension to the elevated track and second for the year's crop of workshop endeavours.

## New track

The elevated track, catering for 3½" and 5" gauges and lies within an area bounded by the combined 5" and 7¼" gauge ground-level track at the society's land in the northern Brisbane suburb of Warner. The kidney-bean-shaped track passing through the gum trees has a loyal group of users who were out in force. Hugh Elsol had his new 3½" LNWR 2-4-0 Jumbo *Hardwicke*, Steve Malone his Perry and Harry Piggott his 3½" *Heilan Lassie*. Harry had the honour of breasting — or should I say buffering — the opening banner and away they all went. Back in 1895 *Hardwicke* was renowned for its speed on the Crewe to Carlisle run in England, and it is interesting to see that the 3½" version can also move very quickly indeed with its 5" diameter driving wheels.

## New locomotives and rolling stock

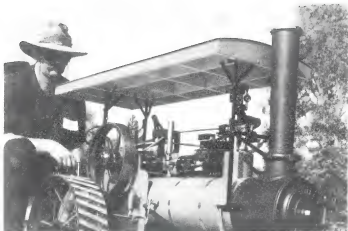
The year has evidently been a very busy one for most members in keeping them away from their workshops, as the tables looked a little bare. Neil McKenzie brought along his impressive 5" QGR 2-6-0 B12, together with scale freight wagons, the loco taking out the championship cup for 1994. The large spark arrester and gleaming dome catch the eye, with the open cab adding a tropical look to the loco.

Among the unfinished locos group, Warren Starr's AD60 Garratt chassis and boiler shell were sitting on a steaming-bay siding — the wheels seem to go on for ever! Warren has put in some solid work and after reading the book *The 60 Class* by Ken Groves, Harry Wright and Mick Morahan (available from AME), I'll be looking forward to see if Warren's loco becomes unbearably hot in the tunnel at Warner!

## Traction

The Carseldine family's Cliff & Bunting traction engine was the only finished traction engine; Roy Bushell's Allchin was in the unfinished category. The Carseldine family have done a fine job with the Cliff & Bunting, and it has become a reliable performer.

Only a few of the entries have been mentioned, and congratulations are due to all category winners. Dale McLennan received the



David Carseldine takes the driving of the family Cliff & Bunting very seriously.

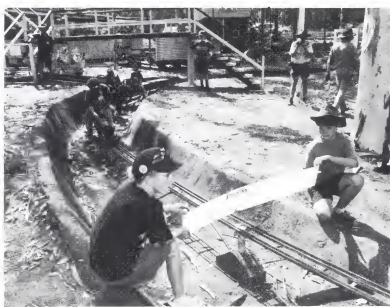


A 60 Class Garratt takes shape in 5" gauge: Warren Starr's interpretation of the NSWGR workhorse.

Myford Encouragement Award, Roy Skyring won the Horology Trophy with his French style clock, and Neil Dannenburg took first prize in the unfinished category with his massive tender for a 7¼" Chesapeake & Ohio articulated 2-6-6-6. If the size of the tender is anything to go by, we are in for some interesting times ahead!



Harry Piggott checks *Heilan Lassie* water and pressure before heading off on the elevated track.



Michael Weaver and Owen Coster hold the re-opening banner ready to be broken by Harry Piggott.

# Euroa Miniature Railway

Story and photos by Murray Hill

The members of the Euroa Steam Locomotive and Model Engineering Society Inc. became the proud owners of a new railway situated at a small country town on the Hume Freeway, on 23 October 1994. Euroa, halfway between Melbourne and Albury, is a prime wool growing district. Nowadays it is a pleasant peaceful town straddling the Seven Creeks, where Ted Murrell moved a couple of years ago from Nathalia (100 Kilometres to the west).

## Ted Murrell

Ted is not only a prolific loco builder (14 at the last count), he has contributed to AME on numerous occasions. His latest claim to fame is the establishment of a new miniature railway club. Ted has been a member of both the Moorabbin and Altona clubs for many years so has a good background in club operations, but his main attribute is enthusiasm. Arriving in a new town at an age in excess of 80 years, he has managed to galvanize over 25 members into a well oiled and highly efficient club in a couple of years. What is most remarkable is that there are only four model engineers among them at present, but several are retired railway men. The members were just caught up in Ted's Enthusiasm to provide a worthwhile facility for the town.

## Community support

The local Council has been very co-operative, which has been most helpful, with earth moving equipment, etc. The council realizes the advantage to the community of the railway and club. The railway is situated between the sites of the bowling, croquet clubs and the seven creeks. The croquet club has made its club rooms, kitchen, etc. available to the railway club, thus saving the initial hassle that most newly formed clubs are faced with, to provide such necessary facilities. The second advantage is that the piece of ground has sufficient undulations to make it a realistic operation for loco drivers.

## The site

It is a beautiful site with many 100-years-old-plus red gums making it an ideal setting,



A general view of the facilities.

the shade is most welcome. More land is available for future expansion. That all this was achieved in a little over twelve months is truly amazing (a bit like Casino and Cobden, who have done likewise). Just shows what can be done with sufficient determination and enthusiasm.

## The track

Using the "slotted sleeper" type of construction that is quick, cheap, easy and effective (also being flexible, allow for correct and true alignment after assembly). The track is approximately 300 metres of 5" and 7 1/4" gauges, with unloading ramp, turntables and steaming bays, plus a station passing loop, a station and store building.

Eight steam and two diesel locos ran for the day (unfortunately not 7 1/4" gauge). There was a large public gathering, parents and children thoroughly enjoyed themselves, and look forward to the next public run day, which will be the 4th Sunday of each month except December.

## Official opening

Sunday 23 October 1994 was selected as the *big day* for the official opening and fortunately it was an excellent day weatherwise. Many local dignitaries were in attendance as well as representatives of the AALS and most of the Victorian plus a couple of NSW clubs.

At 2.30pm, club President Stan Duncan opened the pro-

ceedings and welcomed those present with thanks for their attendance and then introduced in turn; the Vice President of the Euroa Shire, Cr. Esme Stringer and Murray Hill, President of the Victorian State Branch of the AALS both of whom addressed the meeting on the importance of the day's proceedings, from their respective view points.

In Murray's case he made a point of welcoming the new club to the ranks of the AALS fraternity and knew that they would greatly enjoy the benefits from the association, and that it was great to have yet another affiliate, to expand the bonds of friendship in our great hobby, also the benefits to the town in the form of tourism, youth occupation and the club fellowship and especially great thanks to Ted for his unflinching enthusiasm, to make it all happen and he praised the club members for their unstinting support in time and labour.

Cr. Stringer said that council fully supported the Mini Railway as they saw it as an additional tourist attraction and entertainment facility and in consequence presented the club with a cheque for \$2000 to go towards material costs which was gladly accepted.

Altogether a most enjoyable day was shared by all in attendance, and augurs well for the clubs future.



The society founder at the microphone during the opening speeches.  
Stan Duncan, the society's president, waiting for his turn.



The new station and passing loop.

**Running days are the 4th Sunday of each month, except December**

# What is Freelance?

## Modifying the 7¼" gauge *Marie Estelle* steam locomotive design

Story and photos by Graham Vause

When it comes to model steam locos one often hears the term "freelance design". To me this seems ambiguous terminology which has been associated with the hobby for decades, and I wonder how it is decided what exactly qualifies as a freelance loco. The dictionary definitions are interesting!

Anyway, as it applies to our hobby, what does it mean? Is it:

1. A one-off design created by an experimental engineer, having no resemblance to a previously built loco? or
2. A proven design built to a scale, but has minor alterations to suit the whims of the builder? or
3. A popular design that in the builder's mind was crying out for major alteration, for the improvement of

- performance,
- appearance and
- personal satisfaction?

Personally I do not know the answer, in my case I think category 3 would apply. The following gives reasons for this assumption.

### Selecting a loco design

I had the desire to construct a loco that could be built and handled with my modest equipment. A loco that was not in the hernia class, but capable of pulling a reasonable load over our challenging Casino track (a return run of almost four kilometres). It was decided, in my wisdom, that the 7¼" Don Young design *Marie Estelle* would be suitable and the plans and castings were duly received.

Now I have heard nothing but praise for Don Young designs, but on looking at the plan and general arrangement of the *Marie Estelle* I was very disappointed — in fact I hated it. This is in no way a reflection on Don Young, it was just that to me the loco lacked appeal and appeared to be out of proportion in many ways.

The problem was, what could be done about it?

### Pony truck and smokebox

After hours of deliberation I drew up a rough general arrangement and included a front pony truck by increasing the length of the frame by 3". This of course resulted in the original smokebox being too far back from the front buffer beam. As I was not impressed with the one-piece design of the boiler shell and smokebox, it was decided to use a separate smokebox of 6½" outside diameter drawn steel pipe, adding a little to the length to balance the appearance. The steam inlet pipes were relocated through the smokebox

sides into the top of the steam chest, as it is with most outside cylinder locos. The complicated set-up in the plans, which made the fitting of these inlets plus exhaust pipes in the saddle most difficult, was eliminated.

In Don's plans the boiler shell-type smokebox has a large cut-out in the bottom where it meets the saddle. Therefore, a great air space exists under the smokebox to the bottom of the deep saddle and base fixing plate. Apart from the sealing aspects, how this space is cleaned of smokebox ash was beyond me. By adopting the conventional type smokebox this problem does not exist.

As per the plans, the smokebox saddle is held in place by a fixing plate which extends under the saddle across the lower edge of the frames. This plate allowed the fixing of a rearward extension bar in the centre of the frames for the swivel-joint pony truck attachment. This bar extended to just clear the front axle eccentrics and produced a swing arc of approximately 9" to the pony truck, which works well. The pony truck has side control springs and adjustable load tensioning.

### Strengthening the bar frames

As construction progressed it was considered that the *Marie Estelle* (should I now call it *My Concept*?) frames could be further modified. Originally the horn blocks were simple L shaped bronze castings hung down from the single bar frame (bolted of course) — a sort of upside down L either side of the axle boxes. This worried me, so a length of ½" square solid bar was fitted from the leading horns right back to the rear buffer beam. Bolted to the bottom of each horn leg, it acted

as a one-piece axlebox keeper. This simple addition changed a flexible single-bar frame into a robust twin-bar arrangement that subsequently proved to serve a host of uses such as attaching fixing plates for brake gear, attaching mechanical link fittings for draw cocks etc.

### Boiler modifications

Steaming qualities were high on the priority list and, after consultation with my friendly boiler-building mate, it was decided that a 3" increase in the boiler length would be a major improvement. Boiler diameter remained at 6". The firebox length was increased by 2" and the other inch added up front. All this resulted in the boiler backhead projecting further into the cab. Two superheater tubes were installed.

Naturally, when all the mechanical parts were assembled and the Stevenson link valve events adjusted, the usual air running adjustments were carried out. Amazingly, everything worked as it should, smooth but stiff. As we did not alter any of Don Young's wheel or valve design, I guess we did not expect any problem in this department, so Don's reputation remains intact.

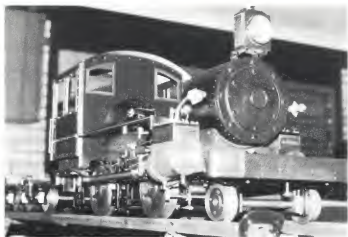
### Cab

The cab of *My Concept* was next on the agenda for re-design. The roof height was lowered and the length of the cab sides and roof increased. The lower ends of the cab sides and the mounting method were very much altered. As the lasting qualities and strength of wood (as per plan) were doubtful, the cab was constructed in ½" aluminium

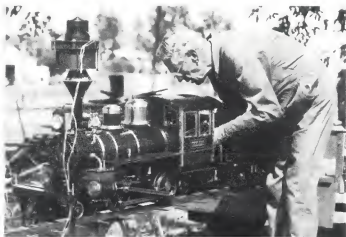


*Gee-Jay enjoying a lunch time break. Could anyone pick it for a Marie Estelle?*





The cab has been positioned and the steam inlet pipes are being tried for position. Note the larger smokebox door.



The author raising steam for the shakedown run.

sheet, it's a sturdy unit which can be removed in minutes if necessary.

On this particular design, axle pumps are a no-no, so a cross-head water pump was designed and fitted. This in itself proved to be a challenge, as clearance was at a minimum. The pump, with a  $\frac{1}{4}$ " bore and  $2\frac{1}{2}$ " stroke, was finally perfected. A clearance between the lower inlet valve body and the crank rod of just  $\frac{1}{8}$ ", when the crank is in the 12 o'clock position, was allowed. The pump has proven to be most adequate, and selective positioning of the bypass valve will maintain water levels without killing the boiler. It is a real boon on our track and well worth the installation — even if only as insurance. In addition, it is so easy to remove and repair if necessary. Two injectors are also fitted.

Lubrication is by mechanical pump mounted on the running board, using one-way clutch drives. What a marvellous invention these little things are!

## Springs and tender

Leaf springs are used for the driving wheels suspension, straddling the frames. The springs over the front eccentric axle, being relatively stiff, do not affect the Stevenson valve timing but retain a flexing quality.

The so-called tender as in the *Marie Estelle* plans was discarded. I needed a ride-on unit with adequate water supplies, so it was back to the drawing board. (Now at this point I can understand readers thinking this bloke isn't building a *Marie Estelle* or a *Marie* anything... he's building a *Thing*. Well, I will give a response to this later on.)

Two four-wheel bogies were designed using compensating equaliser bars and coil springs. Side plates and compensating bars are flame cut from  $\frac{3}{16}$ " steel plate. Axles run in  $\frac{3}{4}$ " diameter bronze bearings. The tender frames were fabricated using 1" angle and flat bar stretchers. A drop-in water tank of copper sheet holds  $5\frac{1}{2}$  gallons of the vital  $H_2O$ . The external panels and top are of 16swg steel sheet which was etch-primed before painting. The entire body shell can be removed from the chassis in minutes.

Vacuum brakes are fitted to the tender bogie. The overall length of the loco and tender is 70", some 30" of this being the tender. A cushioned seat on the tender allows easy access to the controls and provides a comfortable driving position.

Other little refinements on the loco are a mechanical parking brake, working headlight, and full-size drop-out smokebox door. On the plans of the *Marie Estelle*, entry into the smokebox was through a small (approximately  $2\frac{3}{4}$ " dia) hole. How the smokebox is cleaned out is a mystery to me.

The loco is finished in signal red (two-pack auto lacquer) with oodles of brasswork, lining and gold lettering. *My Concept* is named *Gee-Jay*, because I couldn't come up with an appropriate name other than the initials of my Christian names.

On most of our club running days *Gee-Jay* is rostered as a money-earner for the club: usually this entails constant passenger hauling from 10am to 4pm. On a level track she is capable of hauling two full carriages of about 12 adults, but due to the nature and grades of our layout and for the preservation of the engine I have limited the load to six adults or eight to nine young-uns. This is mainly because of loss of traction at a couple of sections of the line (similar to the famous Cowan Bank but in scale a lot longer). One particular section is a sneaky 1 in 35 at the exit of a bend at the end of some 200 metres of 1 in 45 grade. This even tests the big-uns. Perhaps about 100 pounds of lead, if I could fit it, would improve things.

## Lost the plot?

Now for the benefit of those readers with nasty thoughts who may be reading this. Referring to my earlier comments about "he's building a *Thing*", my response is simply this. The *Marie Estelle* or *My Concept* has finished up as a "purpose built loco" constructed with some *Marie Estelle* castings.

Perhaps I lost the plot (or the plans), but the proof is in the pudding as they say. *My Concept* performs better than I expected and, dare I say it, has shown some of the award winning, rivet-counting class locos (and I in-

clude some that I am envious of) what continuous running is all about. No lengthy stops for steam-up, no frequent stops for adjustments, boiler-feed shortcomings or other hold-ups, even of a minor nature. Maybe it's just plain luck, I do not know.

Total building time, start to finish, was 13 months. I did not count the working hours, but it was finished in October 1992. The loco has now completed some 150 hours of running.

Much gratitude must be awarded to my mate Bill Heard of Ballina who advised, assisted with heavy machining and most of the boiler, and importantly prevented me from getting carried away with some of my ideas — thanks Bill.

Summing up, the *Gee-Jay* may never win any awards, but this was never the intention. The satisfaction comes when strangers at the track approach and comment "what a lovely engine", or "did you build it?", or "can you buy the kit?", and other complimentary remarks. Elation and pride is reward enough. Simply put, it comes back to: whatever she is, either a *Marie Estelle* or *My Concept*, an *It* or a *Thing*, it would have to be a well-filled wallet that could tempt me to part with her. I love it and what's more it's my first completed loco.

Now back to the questions. When starting this subject it was really intended to open debate on the freelance question. I have got carried away (it appears to be a trait of mine) and erupted into a résumé on the creation of my loco. I hope you will excuse me. Nevertheless it serves to illustrate in some detail the original poser, which requires an answer or two or three. The questions are:

1. Because of the dubious meaning of the word freelance, is a new title required? and
2. What is "freelance"?

Happy building and good designing!



Graham Vause (a founding member of the Pacific Coast Railway Casino NSW.) passed away suddenly in January.

Graham's memory lives on through his generous contributions to AME... bmc



# Maritime Matters

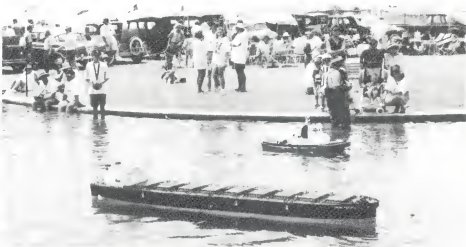
with Leigh Adams

## Newcastle Maritime Regatta

The weekend regatta held on 28 and 29 January 1995 is becoming one of the permanent events on the model boating calendar and is promoted by the Newcastle Model Boat Club in conjunction with the Maritime Museum at Fort Scratchley.

Modellers assembled at Frog Pond on the Newcastle waterfront. Saturday from reports of those who attended was a bit of a washout with very heavy rain falling for most of the day, but not to be deterred they came back for more on Sunday and were greeted with brilliant sunshine, exchanging their raincoats for blockout. The Newcastle club had organized tents at the edge of the pond for a radio compound and display area, these were also used as a meeting place and a welcome relief from the sun.

The aluminium dinghy towed around the pond by model tugs was very popular with the public enjoying rides which raised funds for the museum. Members from the Triple S Club in Brisbane made the trip south, running and displaying some very interesting model submarines. This intriguing aspect of modelling had modellers and the public asking questions all day. All the subs performed exceptionally well, diving and surface cruising around the pond. A.P.S. models have just developed an



Bill Elbourne's bulk carrier *Iron Pacific* experiencing some competition from the vintage cars in the background. A scene from the Newcastle Maritime Regatta.

O Class submarine in 1:48 scale and fibreglass hulls are now available, see their ad on page 8.

Bill Elbourne from the Newcastle club ran his recently completed *Iron Pacific* bulk carrier, this model which is 10 ft long and is ballasted by pumping water into the hull, cruises and handles just like the real thing. This model is outstanding in detail and finish and is a credit to Bill. Keep up the good work!

The Grey Funnel Line was well supported with destroyers, frigates, etc. making regular patrols of the pond. The regatta was well supported by the public with thousands attending over the two days to view with exhibits. So put a cross on your calendar for next year for the Australia Day weekend.

## Handy hint

I read with interest the way in which Ray Lucas makes trenails using bamboo skew-

ers (AME *Endeavour* Story Jan-Feb 95 issue 58). A fellow modeller put me onto another source of fine timber dowels. Johnson & Johnson® make an industrial cotton bud with a long wooden handle. Although I don't know the exact timber, it has all the characteristics of coachwood. These are smooth and tap neatly into a number 42 hole and I have had great success using them for construction and decorative work. Johnson & Johnson 15cm single-ended cotton tipped applicators. Available through most Pharmacies.

## Glues

Building wooden model boats for some years, I have tried various types of glue (PVA, 5 minute Araldite® and 24 hour Araldite) all giving the desired result. While browsing the advertisements in some of the specialist woodworking magazines, I discovered an aliphatic glue TITEBOND II® described as ideal for musical instrument makers. I have been using it for 2 years now and found it one of the best. It sets quickly, no mixing, water resistant and sands off exceptionally well. TITEBOND is available from TITEBOND AUST. Ph. (02) 456 1090.



1/2 scale tug towing the aluminium dinghy around the pond.



Alan Pew from APS models with some of the fibreglass hulls available



Submarines from the Triple S Club Brisbane



# Workshop and Technical

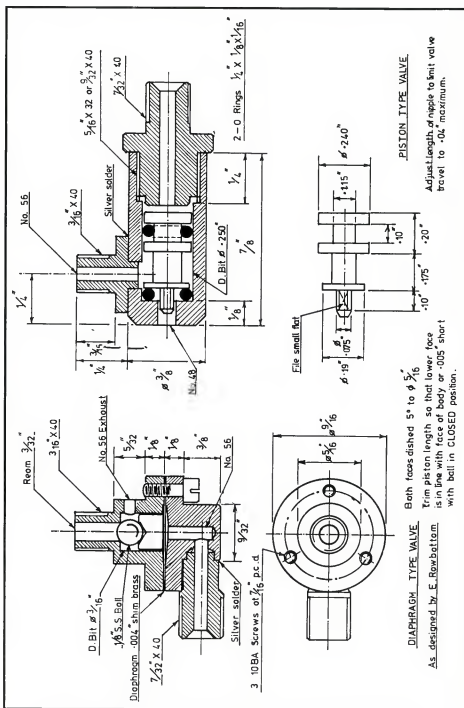
## Drain Cocks

by Bob Kimber

When it comes to cylinder drain devices, it is my firm belief that steam operated valves are the most satisfactory for a variety of reasons. Not the least of these is the ability of many steam operated drains to work as relief valves for cylinder condensate, even when in the closed position. I have enjoyed some success with the two designs illustrated in the accompanying drawing.

The first of these is a diaphragm type whilst the other uses a piston to open the drain. My favorite is the diaphragm pattern, developed many years ago by the late Eric Rowbottom. Correctly made, these are steam tight and therefore require a two-way steam valve to provide an exhaust release. The shim material used for the diaphragm should be 0.002" to 0.005" thick and must be annealed before installation.

Provide a thin paper gasket between the diaphragm and the lower body to ensure a steam tight joint. It will be necessary to do some experimenting to obtain the optimum length of the ball carrying piston. Ensure also that the piston is quite free to move in the housing. The piston type also works quite well. Technically, this valve should also be steam tight and therefore requires a two-way steam valve. In practice however, I have found that leakage past the "O"-ring seals is sufficient to allow the use of a simple one-way valve, arranged to provide for: steam on — valve closed, steam off — valve open. The critical component in the piston drain is the piston itself. Experimentation will be required to establish the final root diameter of the "O"-ring groove consistent with the piston being free moving and with minimum steam leakage. The movement of the piston should also be the minimum possible, to avoid the likelihood of the end "O"-ring becoming displaced. The dimensions shown on the drawing are reliable starting points. Construction of both types of drains is in brass. The thread nominated for the spigot attachment to the cylinder can be varied to suit the individual application.



Article reproduced by courtesy of MELSA Maryborough Qld Newsletter.

## A Simple Friction Locking Device

Sometimes it is desirable to have a friction locking device in preference to a locknut on an adjustment screw. A simple solution makes use of plastic monofilament

[single strand] cord, and a wide range of sizes is available, from the finest fishing line to the cord used on lawn trimmers.

All that needs to be done is to drill a hole diametrically [cross drill] through the screw to neatly suit your size of cord. Then cut a piece of cord about 6mm longer than the diameter of the screw and insert it through the

hole to project roughly equally at both ends.

Now if the screw is inserted into the threaded hole the surplus cord will be sheared off, and the piece retained in the screw will bear firmly against the walls of the hole with sufficient force to secure the screw against slackening off through vibration.

Alan Xeye

# Hernia Gauge Unloader

by Jack Stanbridge

*Photo by the Author*

*Drawing for publication by Brian Carter*

This is an application for unloading heavy locomotives that I have not seen on any other layout [Wagga Wagga NSW has a similar arrangement. ed.]. It is simplicity itself as shown in the photograph. The secret of success is the apron approach tracks.

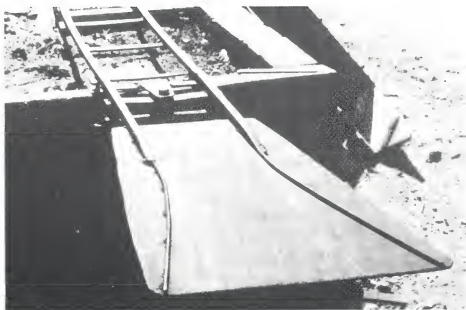
## Construction

I used 6mm diameter round steel rod shaped as the curved guide rails shown. The rails leading onto the apron from the railway are tapered from 25mm thickness down to 6mm.

6mm is used so that the locomotive flanges ride on the apron and allow the 6mm diameter curved side rails to guide the wheel flanges up to the track width and then onto the track. The apron can be made from 6mm thick mild steel plate.

Use a couple of pieces of 50 x 50 x 6mm angle iron on the underside of the apron to get it rigid under load.

Weld the tapered and round sections of rail



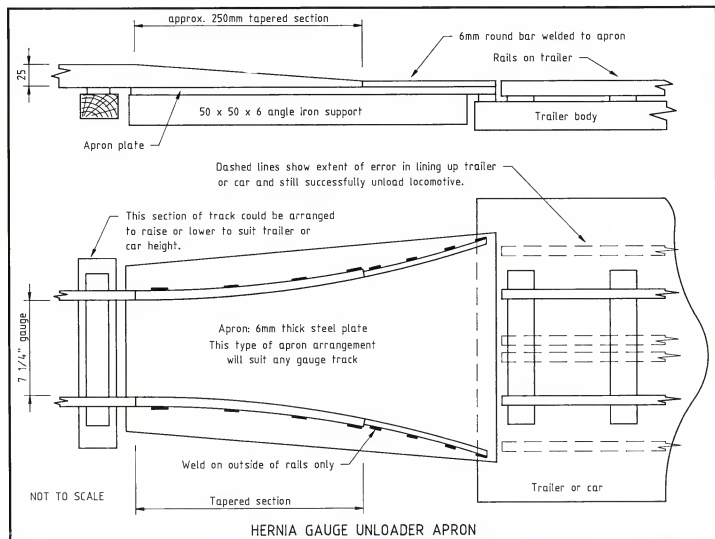
*The unloading/loading ramp on 7 1/4" gauge track.*

to the apron so that the flanges have a clear path, see the drawing below for details.

## Application

This simple device eliminates the need to back up the trailer or car to exactly line up

with the unloading ramp track. Just roll the vehicle back to the apron fitted unloading location, approximately lining up with the track and the apron does the rest.





# Expanding Boiler Tubes

by D. Evans

*Drawings for publication by Greg Young*

Some call this a ball-type, some, a teardrop-type boiler flue tube expander, I'll let you choose whatever name you like. This short article describes how I went about making and using this very useful device. Although this is not my invention — the design has been around a long time — it is easy to make, costs little and works well. Accurately made and carefully used it is almost impossible to damage or stretch a boiler tube, and the end result is perfection.

## Ball diameter calculation

To calculate the diameter of the ball: measure the inside diameter of the tube, add the difference of the tube outside diameter and tube-plate hole diameter, say 2-3 thousandths of an inch, plus 1 thousandth of an inch for each  $\frac{1}{8}$ " of boiler flue tube diameter. As an example: suppose a boiler is to be fitted with  $\frac{5}{8}$ " diameter tubes. Take a length of  $\frac{7}{8}$ " diameter mild steel shaft long enough to make a drift (Fig. 1). Assuming the holes have been drilled with a  $\frac{5}{8}$ " drill, measure the tube-plate hole and then measure the tube. They will be almost identical if the drill is sharp and clean-cutting.

## Ball centre position

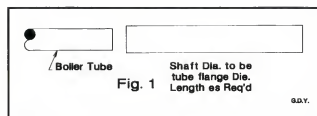
Having determined the ball size, you must now calculate the dimension from the ball centre, to the shoulder that will form the flange on the tube (Fig. 2). As an example: for a tube plate thickness of 10mm, and tube wall thickness of 1.5mm, the relationship of ball centre and shoulder of the drift will be as follows:  $10 + 1.5 + 1.5$  or tube-plate thickness plus twice the tube-wall thickness. The reason for doubling the tube wall thickness is to allow the ball — when driven right home — to swell the tube slightly at the tube-plate inner face.

## Usage

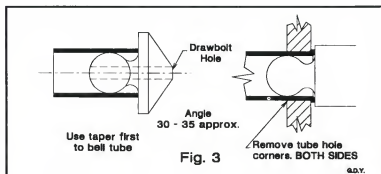
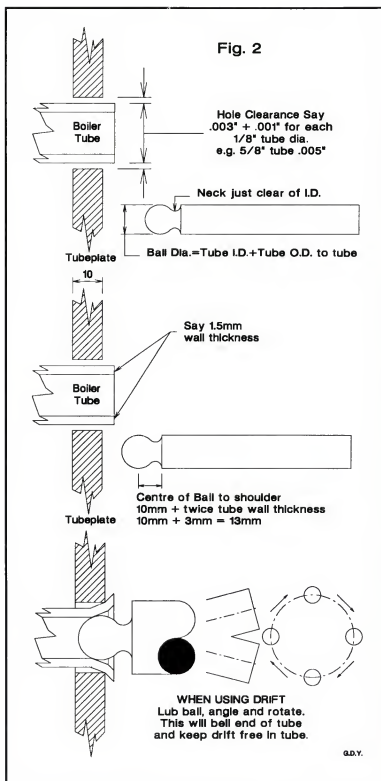
If a situation arises where a drift as such cannot be used, make up the teardrop in a modified form as shown in Fig. 3. This can be used with a draw bolt and pulled through the tube.

Sometimes a leak will show up during a hydrostatic test. If that occurs, a remake is the order of the day using a slightly larger ball. A word of warning here: I refer to a leak as a flow of water and not a single drop that may appear at or about the 200psi (700kPa) mark. Over-tightening of the tubes is not good practice.

Good tubing and better steaming!



**SAFETY — FIRST**  
**LAST**  
**ALWAYS...**



# Clarrie's Place

## Part One

By Dave Harper

Among my friends in the model steam train field, there seemed to be an almost mythical place where they would gather to run their locos and generally socialise, as model steamers are wont to do, but which was spoken of in awed whispers.

It was hinted that it would be worth my while to join one of these outings to report on it for AME.

Eventually, I managed to persuade my other half that our old bomb really would manage an hour's drive up the Bruce Highway, and that I really would be able to spend a day at Clarrie's place!

Following the usual vague directions (take the Maroochydhore turning and it's along there on the right, you can't miss it) I eventually found myself on the threshold of this hallowed ground.

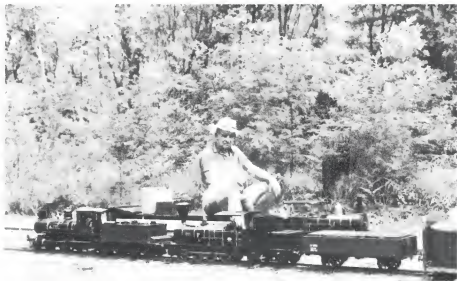
It consists of about 10 acres of more or less level paddock on which is a house, a large shed and an indeterminate mileage of 5" gauge track winding and looping around said paddock. There are also numerous railway buildings modelled on QGR prototypes, some used for housing rolling stock and some set up as camping huts, as is the South Junction signal box seen in the photo. The water tank is functional.

### Siesta and steam

Once I'd driven in and been made welcome, I surveyed the sleepy scene. It was in fact New Year's Day 1994, at about 7.30am, so it was definitely a sleepy scene! There were several locos simmering in the steaming bays, and odd bodies sprawled in shaded chairs in front of the main shed.

This shed is the heart of the setup. A ramped track leads up around the back to a raised turntable from which radiate the steaming bays and a track leading through the back of the shed to a set of storage tracks containing Clarrie's own collection of locos and rolling stock.

The trackwork even mirrors QR practice,



*Em Dieckmann surveys the sleepy scene from his A10 at Clarrie's place, with Neil Mackenzie's A12 and B12 in the foreground.*

Photo: Neil Mackenzie



*Clarrie's signal box and water tank.*

being mostly single track with passing loops here and there plus storage sidings. A Y junction in front of the shed sees the track head off into three basically separate sections, each with a balloon loop at the end.

Nobody has ever got around to measuring the length of track. This may be because sections of it seem to be torn up and modified at fairly regular intervals, and as long as every-

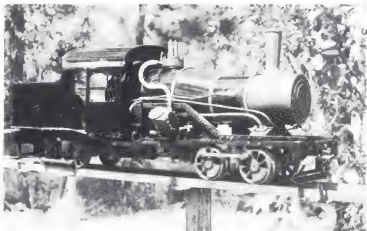
one has fun, who really cares? Suffice it to say that when someone heads out on a loco they can run around for a good half an hour without running over the same track twice!

I was soon invited to hop on behind Ken Saunders as he took off with one of his geared locos. I think it was the Heisler that time; he also had his two-truck Shay there as well.

The V-twin Heisler made a lovely sharp beat as we meandered out past the signal box, past a model station building complete with passing loop, off across the paddock, dipping and swaying over a very rickety trestle only a foot or so high, which traverses one of the many floodways on this plain of content.

After looping around that end, the track reappears alongside the house then swings away for another detour before arriving back at the Y junction. Carrying on out of the third leg of the Y takes us along the driveway, then left across the front of the property where a crossover gives access to another series of loops.

*continued on Page 42...*



*An appropriate timber background for a V-twin Heisler by Bob Kimber and Ken Saunders.*

# A 5" gauge NSWGR 422 class Diesel Outline Locomotive

## Part 19 of the construction of a battery electric locomotive

Barry Glover and Neville Levin complete the cab detailing

*Drawings for publication by Neville Levin & Neil Graham. Photos by Barry Glover & Neil Graham*

Last issue we made a start on detailing the cabs. This issue we complete both the cabs and install the lighting fixtures.

### The door handles

To make the doors of the locomotive look pretty, we require handles and associated escutcheon plates. The handles are a relatively complex shape, so we have opted for lost wax castings again. Four are needed. They are available from Scobie & Glover, who advertise in every issue of AME. Trim up the castings after purchase, then trim up the spigot and run it down M2. If you haven't already done so, mark out and drill the 2mm holes in each door in the location marked in Figure 32 (AME, last issue page 43). Use the door edge line as your datum.

Make up the escutcheon plates as shown in Figure 36. They can be cut from 0.5mm (24 swg) sheet. If you want to be really fancy and have a jeweller's fret saw handy, you can elongate the 1mm hole to make a better representation of the key slot! Assemble the unit by slipping the handle through the plate, then offer it up to the cab. Fit a flat washer and nut to the inside. Align the escutcheon plate then nip up the nut.

### Rear view mirrors

Our intrepid crew must be able to see what is happening behind them along the train, especially in these days without a guard at the



*Our 422 class showing the door handle, marker lights and rear view mirrors in position.*

tail end. So we need four rear vision mirror assemblies.

As designed and fitted to our loco, the mirrors are modified slightly for strength, but the representation is still good and the result is worth the effort. Refer to Figure 37 for details of the mirror assembly.

We start by making the mirror brackets from 5mm (or  $\frac{3}{16}$ ") square brass stock. Cut into eight pieces about 50mm long. Machine down each piece to 2.1mm for a length of 10mm, then thread it M2. Mark and drill the 1mm holes in their correct location. Set the piece up horizontally in the mill with the threaded end about 8mm proud out the side of the jaws; then machine the L shape into the bracket. Cut to length. Finally file to shape as shown. After all the brackets are made, fit them to the locomotive cabs with flat washers, nutted up on the inside, then record the distance between the brackets for all four mirrors.

To make the mirror, start with four pieces of stainless steel of 0.5mm (22-24 swg) thickness cut to shape. Then make up the four mirror posts from 2mm welding rod. Use the recorded distance between the mirror brackets to confirm the length of the thicker centre section of the post.

Next, prepare and silver-solder the posts to the mirrors. Only a small gentle oxy flame is needed: try to avoid buckling the mirror. When finished, pickle the unit in a dilute acid bath and remove any distortion (remember: keep the head back and your eyes and body well protected). Polish the face of the mirror



*42215 in Moss Vale yard showing the rear view mirror and door handle arrangements.*

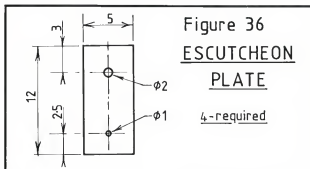
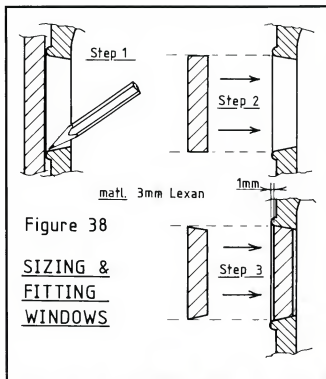
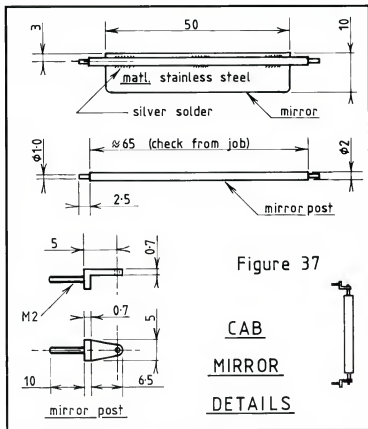


Figure 36  
ESCUTCHEON  
PLATE  
4-required



using the finest wet-and-dry paper, then polish the faces with Brasso® until you can see your reflection in them.

Each mirror can now be fitted: slacken off the brackets, insert the mirror and gently tighten into position. The mirror should be firm and should swivel with slight pressure. If it is a bit sloppy, then a small dab of superglue at the junction of the post and bracket, and keep it swivelling while the glue sets. You will find the action will stay firm.

### Windows

The windows are made from 3mm thick clear acrylic sheet such as Perspex® — but we recommend Lexan®. Lexan is available from Cadillac Plastics (see the Yellow Pages®). Clear plastics are also available from many glass retailers these days. You may be able to obtain some Lexan offcuts from a sympathetic sales assistant, as it is rather expensive to buy

by the sheet. When you purchase it, ensure that the protective paper covering is still in place on both sides.

Start by rough-cutting suitable pieces for each opening. Then mark their positions with pencil on the paper covering, for future reference. Referring to the method shown in Figure 38, run around the inside edges with a sharp pencil. (If you own a linisher, then the next part will be easier. Otherwise it's out with the file and proceed with care!) Carefully grind or file down until you just touch the line. When all pieces have reached this stage, check



*The mirror components for one cab*

the angle of the taper around the openings. Set the linisher to this angle (or note it for filing) and run around the edges until the piece sits approximately 1mm below the outside level of the surround.

You may wish to fit the windows now and mask them out when the locomotive goes to paint shop, or you may wish to leave them out until all painting is finished. One method is as follows. Make up a small batch of Five-min-



*A selection of Lexan "glass" after cutting to shape for the windows of one cab. Note the small rectangular piece near the bottom left which will be a half open driver's window.*



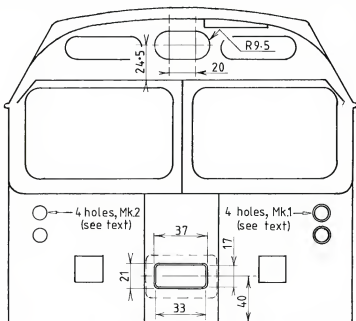
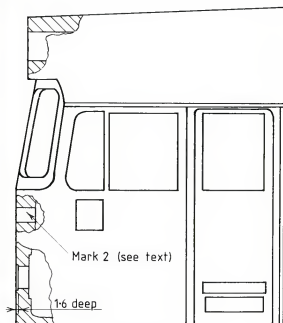
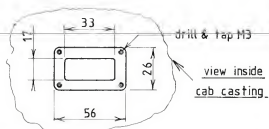


Figure 39

# CAB DRILLING & MACHINING FOR M-U CONNS. & LIGHTS

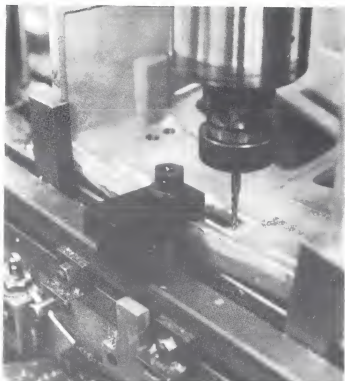
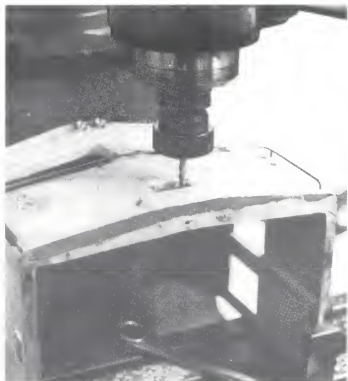


ute Araldite<sup>®</sup> and put a very thin smear around the edges of the glass. Put the glass in place, remove any excess Araldite, then wait

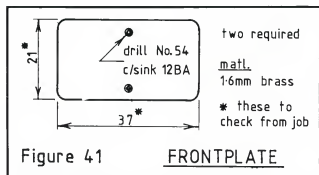
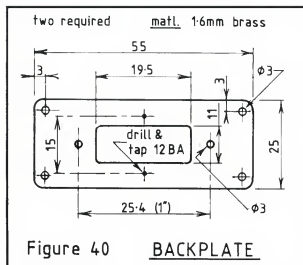
for it to cure. Leave the protective paper on until all is finished and dry.

You may wish to have the driver's and observer's window partially open. The win-

dows open from the top down. In this case, cut the window to the required opening. After that, get a piece of 0.5mm brass sheet some 8mm wide and after cutting to the correct



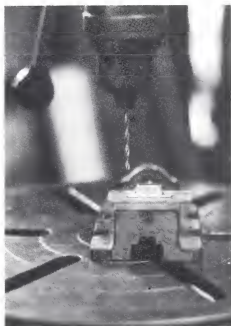
Two views of the machining of the m.u. receptacle location in the cab



length (i.e. the length of the sill), form it into a channel which can neatly sit over the top of the window.

### Horn recess

We will start with the top of the cab and clean up the horn recess. Refer to Figure 32 on page 48 of the last issue of AME. The cab needs to be set up square on the mill. With a small diameter cutter (say 3mm), clean up the casting to the basic dimensions shown. After cleaning up the base area to at least 75%, blend in the un-machined area with emery



flush-fitting cover plate.

Refer to Figure 39 for the location and mark out the cab front. Set up the cab on the mill table with the front facing up. With a 5mm slot drill, plunge through the cab front and mill to the lines (33 x 17mm). Now we have to cut a small recess around the perimeter of the hole. Before cutting this recess, it is wise to get a small off-cut of the same 1.6mm material that you will be using later for the cover plate. We will use this off-cut as a depth gauge for the next operation, as we need to have the cover plate sitting exactly flush when it is put in position. Now pick up the



*Above shows the front of the cab in way of the m.u. receptacle cut-out with the 15-pin m.u. socket in position.*

*Left and Right show the machining of the backplate and then the position of the backplate (with the m.u. female solder pins facing the inside) to the locomotive cab*

cloth, if necessary. No doubt the finished result will vary with individual castings.

Mark out and drill the holes as shown to accept the diesel hornsets later on.

### Multiple unit receptacle

We first had ideas of mounting the multiple unit (m.u.) connections in the same place as the prototype. We even made up the bracket to hold the m.u. female receptacle. However, we have had to revise the location, as we found that we could not sit the unit behind the correct position and then fabricate a satisfactory piece to retain the correct exterior contour.

Hence we decided to locate the m.u. connection in the centre of the cab on a flat section. This makes the machining operations much more practical. When the m.u. connector or cab controller cable is not plugged in, its place will be taken by a small



*Counterboring the recess for the Mark 1 marker lights*

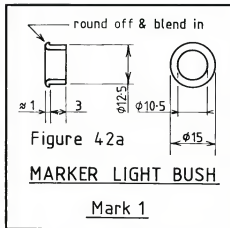
front face with the cutter and mill a 2mm wide x 1.6mm deep recess around the perimeter of the previously cut 33 x 17mm hole. Check the depth with the 1.6mm thick brass off-cut. Now do the same to the other cab.

Set up a cab on the mill table on the front flat face (i.e. nose down). Mark out an area around the perimeter of the hole some 56 x 26mm. Machine this area so that it just cleans up and is flat. Do the same to the other cab. Clean up any burrs, then put the cabs to one side.

### Receptacle backplate and fitting up

Before starting, we suggest you study Figure 40 to get the drift of the required operations. Mark out two pieces of 1.6mm brass to 55 x 25mm. Then either mill or file them to shape to fit the inside-cab milled area. Mark out (from the centre) and drill the necessary holes. Mill the 19.5 x 11mm cut-out in the centre of the plate. The 15-pin female receptacles were listed in AME Issue 50, Sep-Oct 1993, pages 33, item 25. You will need one for each end of the locomotive. The female part of the m.u. plug can now be offered up to the plate and sat centrally, then screwed in position. Now place the whole fitting through the cab from the inside, sitting the brass plate





flat on the machined recess. Ensuring that the plug sits centrally in the cab front hole, carefully spot through the four outer holes in the plate. Drill and tap into the cab from the inside M3 x 6mm (maximum) deep. Be careful not to drill right through. It's best to check the thickness of the casting and drill in as deep as possible without breaking through. When tapping to M3, use sharp taps and frequently apply plenty of lubricant (turps or a proprietary type aluminium lubricating fluid) to avoid breaking your taps.

### Frontplate

To hide the plug hole when it is not in use, we will use a piece of 1.6mm thick brass to fit the 37 x 21 recess. Referring to Figure 41, mill or file the brass to a close fit and then mark out, drill and countersink the two holes for the 12BA holding screws. With the front plate now in place, spot through to the back plate. Remove the back plate, drill No. 60 and tap to 12BA. Put a locating mark on the inside of the cover plate (eg #1 for No. 1 end). This will ensure that the plate goes back on correctly. Now go through the same procedure with the other cab.

### Marker lights

Since we have built our 422 class locomotive, the makers of the specified marker lights have withdrawn them from the market and have replaced them with a type which is too small in diameter. After much fruitless searching, we have decided on a compromise substitute — more on these later. If you have already purchased your marker lights, then we refer you to the instructions for the **Mark 1** lights. If not, then refer to the instructions for the **Mark 2** lights.



A comparison between the Mark 2 marker lights (LEDs on the left) and the Mark 1 type on the right. The left hand light of each pair has the turned brass ring in position.

### Marker lights Mark 1

The marker lights were listed for purchase in AME issue 52, Jan-Feb 1994, page 38, item 1. These need to be modified very slightly. Chuck the lamp assembly very lightly in the 3-jaw in the lathe and with a very sharp, acute-angled tool and the lathe set to a high speed, lightly machine the lens cap's diameter parallel to 10.2mm. Do this to the four red lens caps and four clear (white) lens caps.

We need to make eight marker light rims. They are machined from 16mm diameter brass rod: see Figure 42a for details. It is a fairly simple turning operation to manufacture them, so a blow-by-blow description isn't needed.

The cab now needs to be returned to the mill table, on its back so that the angled front part (to one side of centre) is at right angles to the mill spindle. Chuck in an 11mm slot drill and centre it over the top marker light cast-in protuberance. Plunge right through, then change to a 12.5mm cutter. Counterbore to a depth of 5mm, then change back to the 11mm cutter.

Zero the travel dial, then travel along 17.5mm, over the top of the lower marker light position. Now repeat the process.

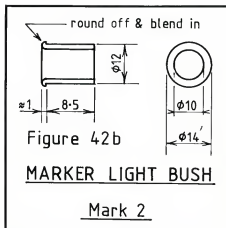
When one side is done, the cab needs to be re-packed to make the other side normal to the spindle. Repeat the above process. When one cab is complete, remove it from the mill and repeat with the other cab.

Look inside the cab casting where the top hole for the marker light comes through. If there is a lip or step on the casting in the way of the top hole, it will prevent the marker lights from being locked up successfully when installed. So, one needs to remove enough of that step to clear the lock-nut when it is installed. Either grind and file it out or set it up on the mill table and cut it out. Check your job by trial-fitting the marker lamps.

### Marker lights Mark 2

We have settled on employing 10mm diameter light-emitting diodes (LEDs) to do the job. The red diodes are OK but the yellow diodes are just that, they emit a yellow light.

The first job is to return the cab to the mill table and lie it on its back. You need to pack one side up so that the angled front is at right angles to the machine spindle. Locate a 12mm slot drill above the top cast-in indicator and plunge right through. Zero the machine travel dial, then move down 17.5mm. This should



put the cutter above the bottom cast-in indicator. Again, plunge right through. Now re-pack the cab so that the other angled face side is normal to the spindle, then go through the same process. When one cab is finished, go through the same operations with the other cab.

The next job is to make up the marker light rims. Chuck a length of 16mm brass rod in the lathe, then refer to Figure 42b for details. It is a fairly simple turning job so we don't need a blow-by-blow narrative. The main thing is to round off and blend in the outside lip of the bush. Eight need to be made. It is a good idea to record the cross travel dial settings for the final cut to 12mm diameter. When it is finished and parted off, check it for a light push fit into the cab casting hole. Adjust the cross travel cut for the next seven rims to attain the required fit.

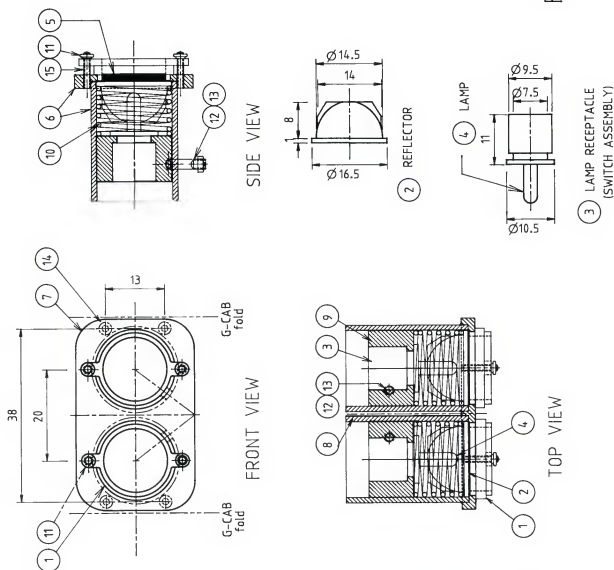
To assemble the marker lamp, just insert the LED into the rear of the marker lamp bush and push it home. Put just the tiniest of dabs of superglue on to the bottom lip of the LED as it is homed into the brass bush. Then insert the assembly into the locomotive cab from the front and push it home. Again it can be held in position with a tiny dab of superglue.

### Headlight position

The headlight boss is cast into the top face of the cab casting. Since we need to have an operating headlight assembly which looks the part, I'm afraid we have to machine this boss off to allow us to fabricate and install the representative lamp holder assembly.

Set the cab on its back and set a fairly large milling cutter in position above the boss. Machine the boss off and keep machining the front of the loco flat for the full depth of that section, so that it is flat for at least 22mm each side of the centre towards the number boxes.

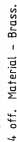
Referring to Figure 39, mark a vertical centre-line then mark a horizontal centre-line for the headlights. Mark a centre-pop 10mm to the left of centre. Set the mill spindle exactly above the mark. Set the travel dial to zero. After fitting a 3/4" diameter slot drill in the chuck and after starting up the mill, plunge the slot drill into the cab front and right through for the full depth of the slot drill. Travel the table along exactly 20mm (i.e. 10mm the other side of centre), then plunge



PARTS LIST	MINI-MAGLITE PART NUMBER	QTY
1. HEADLIGHT RIM		4
2. REFLECTOR	* #87931	4
3. SWITCH ASSEMBLY	* #87937	4
4. LAMP /BI PIN	* #87500	4
5. LENS		4
6. PANEL & BODY ASSEMBLY		2
7. HEADLIGHT PANEL		2
8. BODY		4
9. FOCUS NUT		4
10. COMPRESSION SPRING		4
11. RETAINING NUTS, H'LITE RIM		8
12. 8BA Skt. Hd. GRUB SCREW x 3mm long.		8
13. 8BA NUTS		8
14. FIXING SCREWS, 12BA x 20mm SH. Ch.Hd		8
15. STUDS, H'LITE RIM, 12BA x 8mm, SHL. (cut down 12BA x 10mm SHL. screw).		8

Figure 43 HEADLIGHT ASSEMBLY





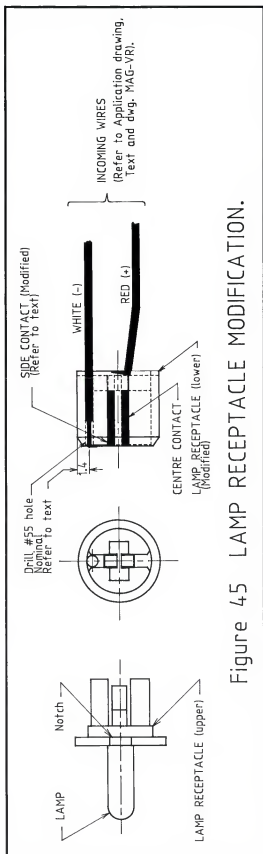


Figure 45 LAMP RECEPTACLE MODIFICATION.

the slot drill right through again. Now carefully machine out the remaining part of the ligament between the two holes so that you finish up with the required elongated slot.

### Headlight construction

Mechanical drawings of the Headlight Assembly are in Figures 43 and 44. The detail items are spread between these two drawings.

The quantities of each are shown in the Parts List. The balance of the parts should be purchased. The Head Light Rims (Detail 1) may be fabricated or purchased as brass investment castings from Scobie & Glover. The headlight parts required are from the Mini Maglite® size AAA.

\* Mini Maglite is a registered trademark of MAG Instruments, Ontario CA of USA.

The Mini Maglite AAA Lamp Receptacle needs modification. The receptacle is shown in Figure 43, Detail 3, and in Figure 45.

The lamp connections must be isolated from the Focusing Nut (Detail 9). Therefore, the lower part of the Lamp Receptacle containing the Lamp Contacts requires modifying (as in Figure 45) to enable the Side Contact to be shortened and a wire to be connected in lieu. When the Lamp Receptacle is removed from its packaging, it may be necessary to dismantle the upper and lower parts. Simplify this operation by making up the wooden or mild-steel tool shown in Figure 46. To separate the parts, place the two prongs of the tool in the two holes in the bottom of the lower Lamp Receptacle. Hold the lower part of the Receptacle (below the groove) and gently apply pressure to push the upper part out of the lower part. This is a gentle and not-to-be-rushed operation, unless you have plenty of money and lots of fingers!

As the separation of the two parts progresses, note that the upper part has a notch in the rim, adjacent to a different type of peg or dowel that fits into the lower part on either side of the two contacts. This information will be useful for correctly re-assembling the two parts of the receptacle. After each movement, try to remove the upper portion with your fingers. Eventually you will separate the two parts. Now carefully remove the side contact (the one which has a little wing extended to the side of the lower part). With a sharp pair of snips or scissors, snip off the wing about 0.5mm from the edge of the square contact hole. Store the contact in a safe place until required for re-assembly. To provide the hole for the Side Contact connecting wire, place the lower Lamp Receptacle on the bench, top up. Inside the chamfered rim, 1.4mm from the side where

the Side Contact wing has been shortened, prick punch the spoke and drill a No. 55 hole through to the bottom. Remove any burrs and lightly countersink the bottom face of the hole. Using a fine-tipped solder bit and flux-activated solder, sweat a length of red PVC insulated flexible wire (recovered from the m.u. cable exercise), to the flap on the bottom

end of the Centre Contact. Select a similar piece of wire — coloured white this time — and strip about 2mm of insulation off one end. Pass this end up through the hole in the bottom, bend about 1mm of the bared wire over at right angles, and sweat it on to the shortened wing of the Side Contact. Use the solder sparingly! Don't fill up the hollow contact.

At this stage you have completed the modification of No. 1 Lamp Receptacle. Repeat the process and modify Nos 2 & 3 receptacle. Modify No. 4 only to the point where the wires are to be terminated. Number 4 will be used for a check gauge during the manufacture of the Focusing Nuts (Detail 9), after which its modification can be completed.

### Detail 5

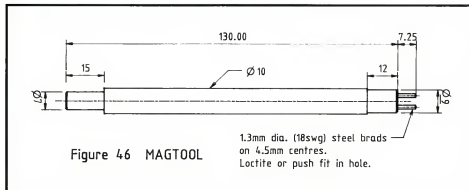
For the lenses, cut four pieces of 1.6mm perspex (acrylic) and grind them to a rough 16.5mm diameter circle. Make a mandrel from a piece of 19mm (3/4") scrap brass or steel by placing it in the lathe and face off the end. Centre the end so that the face is flat. Reduce the diameter so that it's a sliding fit into the 14mm (nominal) hole in the Head Light Rim. Using an adhesive such as superglue, attach the perspex lens on to the mandrel, making sure that the perspex covers the mandrel face. Carefully machine the lens diameter until it is a push-fit into the Headlight Rim. Lever the lens off the mandrel by sliding a sharp blade between the surfaces or giving the edge of lens a light tap with a blunt instrument. Be careful not to disturb the mandrel setting in the chuck! Continue making lenses until four are complete. While the mandrel is still in the chuck, apply a thin smear of silicon sealant on the inside of the Rim and with the Rim resting against the cross-slide, use the mandrel to press the Lens squarely into the Rim. Continue the process until all four Lenses are inserted into their respective Rims. If you don't have a lathe, file for best fit and use the bench drill to press the Lens into position in the Rim.

### Detail 8

Hold a length of 3/4" (19mm) x 18g brass tube in the self-centring chuck (the only brass tube available was Imperial!). Machine the end so that it runs true. Part it off so that the tube length is between 28 and 29mm long. Continue until you have four pieces for the Lamp Bodies. With a single-cut smooth file, clean off the burrs inside and out on both ends of the Bodies. Lightly chamfer the outside corners. Now, slip a Body on to a 12mm (nominal) wooden or steel rod and rest across the partially open jaws of the vice. Mark and centre-pop for the Clamping Screw hole 19mm from one end. Drill (No. 50) 1.8mm and tap 8BA.

### Detail 7

From 3mm scrap plate or flat brass strip, machine two pieces 26mm wide and 42mm long for the Head Light Panels. Mark one side rear. On that marked rear side, carefully mark out the holes shown on the drawing and prick punch their centres accurately. Check the upper and lower rim fixing holes (to be



tapped 12BA) by comparing with the rim holes. If necessary, correct the centre distance. Lightly centre-pop the Head Light holes. Carefully drill the four 1.1mm (No. 58) tapping holes for the 12B A studs and follow this up with the four 1.4mm (No. 54) Panel Mounting Holes. Now set up the four-jaw chuck in the lathe and adjust the jaws so that when the Panel is held in front, a Head Light centre hole is just about on the centre line of the chuck. Insert the Panel in the chuck and — using parallels, inside callipers or a dial indicator to get it parallel with the chuck face — lightly clamp it in position. Now use your pet technique to centre the Headlight hole. We use a length of 3mm silver steel with a point that has been rough-ground on one end. Insert the rod in the tailstock drill chuck with the point towards the work. Carefully bring the point up to the centre pop so that the rod en-

ters the cone and just starts to bend. Back off until it just loses the bend and tighten the tailstock clamp. Place your dial indicator on the cross-slide and move it against the rod. Rotate the chuck and check for out-of-true. Adjust the jaws until you have the centre-pop running true (about 0.025mm [0.001"] accuracy, thanks!). Drill and bore the through hole to 16mm. Counter-bore the rear face 19.05mm diameter or until a Body (Detail 8) is a nice sliding fit in the hole. Bore the hole until it is 1.25 to 1.5mm deep. Don't tap the 12BA holes yet — this will be done after the Panel and Bodies are assembled. Finish the perimeter of the Panel to shape.

#### Detail 9

During the production of the Focusing Nut, you will need to use the two parts of Lamp Receptacle No. 4 (not yet completed) as a check gauge. Read through the remainder of the Detail 9 description before starting.

The Focusing Nut should be a neat sliding fit inside the Body as it has to hold the Lamp in the focal plane of the Reflector. Time and patience correctly applied here will pay off with a set of headlights once seen, never forgotten!

Set a piece of 19mm (3/4") diameter brass rod in the self-centring chuck and turn it down for about 15mm of its length to give a sliding fit in the brass tube (Detail 8). Face the end, centre drill and, using a drill just under 7.5mm diameter, drill a hole at least 15mm deep. Using a

small boring bar, open the hole up to 9.65mm for 1.2 to 2.5mm in depth or until the lower Lamp Receptacle is a neat sliding fit in the hole.

Make sure that the blind end of the hole is fairly square or — preferably — a slightly acute angle with respect to the side of the hole so that the true width of the flange may be measured, allowing the lower Lamp Receptacle to lock securely to the upper part. Remove the sharp inside and outside corners on the flange. Part off the Nut at 13mm from the end. Now, to complete the operation, remove the stock from the chuck and, with a vernier slide calliper, measure the depth of the 9.65mm diameter hole and the length of the nut. Calculate the width of the flange by subtracting one from the other. The flange width should be no greater than 1.5mm.

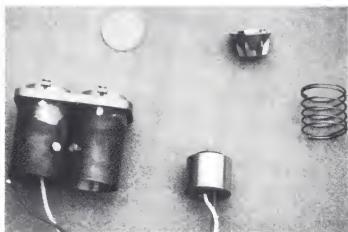
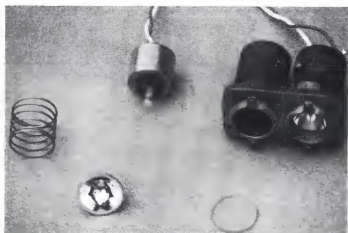
Carefully set the Nut up in the chuck with the flange face out, making sure that it rests evenly across the teeth of the chuck jaws. Tighten the chuck and bore the small hole to 7.5mm diameter. Without changing the chuck setting, face off the material calculated to make the flange 1.5mm wide. Check the width of the flange again and, if necessary, continue the process until the flange is equal or 1.5mm wide. Remove the sharp inside and outside corners on the flange. With the work removed from the chuck, check that the fourth lower Lamp Receptacle is a neat sliding fit in the 9.65mm bore. Hold the lower Receptacle against the flange and, making sure it is correctly polarised to enter the lower part, try lightly pressing the upper Lamp Receptacle through the 7.5mm hole in the top of the Nut so that it enters the lower part. If the shoulder is the correct width, the two halves should close together with a little snap! (No, not a breaking snap — a clicking snap!). To get them apart, apply the separating tool and technique described earlier for the production of Detail 3. If the lower Receptacle is a push fit in the bore, use the plain end of the tool to push it from the Focus Nut.

Having successfully completed the first Focus Nut, the hard part is over; just produce three more of the same! Attach the wires to the fourth lower Lamp Receptacle.

#### Detail 10

The Compression Spring maintains beam focus by holding the Reflector securely against the flange machined in the Panel. The Spring is made from a length of 22 swg stainless steel, type 304, with seven to eight turns wound on a parallel wooden mandrel 12mm in diameter. The Spring should be a free sliding fit inside the Body and should rest flat against the outer rim of the Reflector and with some compression on the Focus Nut.

Four Springs are required, and as there are a number of ways of making coil springs, we'll leave that to you. If you are winding it by hand in the lathe, then protect your hands with gloves. The fully compressed length of a Spring must be less than 16mm. Now, if all that seems a bit daunting, Scobie & Glover are selling ready-made springs.



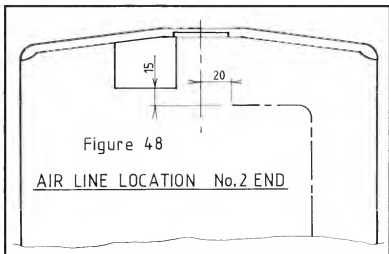
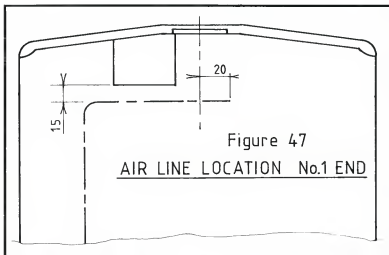
Two views of the components and headlight assembly for one unit

#### Detail 11

Again, time and a little patience here will result in a successful job. The Headlight Rim Retaining Nuts are made out of a length of 3mm brass or brazing rod. Set the rod up in the self-centring chuck with about 10mm projecting from the jaws. Face off the end, centre drill, and with a 1.05mm (No. 58) drill bit, drill a hole about 1.5mm deep. Reduce 0.6mm of the end to 2mm diameter. Part off 1mm long. If you can't part off, cut it off with a jewellers saw. In a similar manner, produce another seven Nuts up to this stage.

Before taping the hole 12BA, we have to machine the sawn face. File off any burrs from the edge of the sawn face. Make a split nut consisting of a piece of 4mm rod 20-30mm long with the outer end faced and reduced to about 2.5mm for 1.5mm, drilled 2mm diameter right through and having a longitudinal slot on one half throughout its length. Place the split nut in the lathe chuck with about 10mm protruding.

Carefully slip the parallel shank of the Retaining Nut into the split nut and tighten the chuck. Machine the face of the Nut to size by taking light cuts with a sharp tool. While this is set up, machine the rim round with a file or tool and tap the hole in to 12BA in Detail 11. Alternatively, place a 3mm steel rod centrally in the chuck. Turn down the end with a roughish finish for about 1mm so that it fits into the



No. 58 hole in the Nut with a sliding fit. Put a drop of superglue on the rod and pop a Retaining Nut on the spigot, rough side out. If it is cold, you can speed up the curing time by warming up the nut to about 30 degrees with the LP gas torch set to a low flame [or put it close to a light bulb — bmc]. Carefully machine the face of the nut to size by taking light

Panel with a piece of emery cloth. Liberally coat each face with silver soldering flux and fit the Bodies into the blind holes with the two clamping screw holes set at an angle of about 40 degrees to the panel centre line, as shown in the drawing. Check to see that the Bodies are properly seated on the bottom of the blind hole, and that they are parallel and square with the Panel. Place the Panel face down on a flat fire brick and position a 4mm piece of 1.6mm No. 245 silver solder against the junction of each Body and Panel. Maintaining a circling motion, slowly heat up the assembly with an LPG torch fitted with a medium nozzle. Continue the action until the flux changes to a clear liquid, followed by the solder flashing around the joint. As you watch the solder flow, chase it with the outer tip of the flame: if the job has been evenly heated, the solder will run right around the joint. If it freezes on the way around, go back to the circular motion until the trip is completed. Leave the unit to cool to a black heat while you repeat the process on the second unit. Keeping the head back and eyes protected, lower the first assembly into a clean bucket of water and let it soak. Having finished the second unit and using caution, lower it into the bucket. Remove the first assembly and clean off the flux with an old toothbrush or nailbrush. If you've burnt the flux on to the surface you may have to

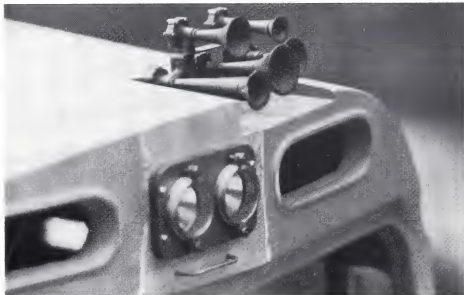
cuts with a sharp tool. Machine the rim round with a file or tool. To remove the nut from the spigot, re-warm and pull off. Tap 12BA by holding the Nut square in the vice soft jaws. Continue to produce the other seven Nuts using whichever method takes your fancy.

#### Detail 15

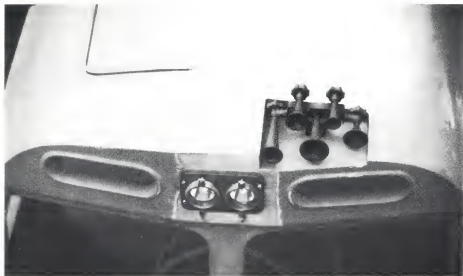
The final parts to be manufactured are the eight Studs for retaining the Headlight Rim and Lens in position. Either thread a length of 1.3mm (18g) steel rod with a 12BA die and carefully cut into 10mm lengths using a jewellers saw, or buy some 12BA x 10mm cheese-head screws and carefully cut off the heads.

#### Assembling the headlight

Now that all the parts are completed, we can start to assemble the parts for the Head Light. The Body is to be silver-soldered to the Panel, so you carry out the assembly operations for both pairs of Head Lights at the same time. Clean the mating faces of Body and



*A close-up of the horns and headlight assembly on the model from the observer's side.*



The No.2 cab of our 422. Note the air horn cluster and the signal air line in position

pickle the unit in a weak solution of sulphuric acid — again using care. After a few minutes, lift it out of the pickle bath with a hook made from 3mm wire. Give the assembly a thorough wash under the tap, followed by a brushing with the brush until clean. Repeat for the second Head Light assembly.

Holding the edges of the Headlight Panel in the vice with soft jaws, carefully tap the four 12BA stud holes in the Panel. Wash the Headlight Panel & Body assembly in solvent and set aside to dry while you find those little 12BA Studs

(Detail 15). Wash well in solvent and blow dry. Using a tooth-pick, place a tiny drop of Loctite® 621 on the end of the Stud and screw it into the front of the panel, leaving 5mm of the Stud exposed. When the Loctite has cured, use a file to finish the stud flush with the reverse side of the Panel. Clean off any surplus Loctite. Paint the Panel and Body assembly all over, and the Headlight Rim, using Motorspray® automotive etch primer and an undercoat. To prevent paint from clogging the Stud threads, slip on a length of PVC sleeving before painting. When the undercoat is completely dry, insert the Reflector, Compression Spring, the assembled Lamp Receptacle and Focusing Nut with Lamp into the Body, as shown in the assembly drawing, Figure 43. Take care not to move the wires about too much. Place a fine string of silicon glazing adhesive around the outside of the 15.9mm ring of the Rim and mount the Rim on the Studs, with adhesive sealing the joint between the Rim and Panel. Run the Retaining Nuts on to the Studs until they firmly retain the rim and seal. Screw an 8BA x 3mm socket head grub screw with the Nut into the



A front-on study of locomotive 42201, seen here resting in between turns at Moss Vale yard. This 25-year-old workhorse still earns her keep on the main south in NSW. She now sports the "Scalch Blue" livery of NSW Freight Rail. The buffer plate has long since gone.

## Materials and Parts list

Item Qty	Description	Part No.
<b>1</b>	<b>Headlight Mini MAGlite AAA</b>	
	made up from the following three items	
1a 4	Reflector	87931
1b 4	Switch assembly	87937
1c 4	Lamp bi-pin	87500
N.B. Do not touch lamps with bare fingers.		
<b>2</b>	<b>Marker Lamps</b>	
4	10mm LED Red (Dick Smith)	Z-4060
4	10mm LED Yellow ( " " )	Z-4062
<b>3</b>	<b>Door Handles</b> from Scobie & Glover	
<b>4</b>	<b>Rear View Mirrors</b>	
	Scraps of 0.5mm stainless steel sheet	
1	300mm 2.0mm welding rod	
<b>5</b>	<b>Windows</b>	
1	300mm sq. x 3mm Sheet Lexan from Cadillac Plastics (Sydney)	
1	small scrap 0.5mm thick brass sheet	
<b>6</b>	<b>Headlight &amp; m.u. Materials</b>	
1	200mm brass sheet 1.6 x 25mm	
4	Headlight rims from Scobie & Glover	
1	300mm offcut of m.u. cable	
1	50mm x 3/4" dia. x 18g brass tube	
1	100 x 3 x 26mm brass flat	
4	Headlight focus springs, Scobie & Glover	
8	12BA x 10mm cheese head set screws	
8	12BA x 6mm hex head set screws	
4	12BA x 12mm countersunk set screws	
4	8BA x 3mm socket head grub screws	
<b>7</b>	<b>Signal Air Line</b>	
1	600mm x 1.6mm diameter copper or mild steel soft wire	
<b>8</b>	<b>Horn Clusters</b>	
2	Hornsets from Scobie & Glover	



hole in the Body. Repeat the assembly procedure for the second Lamp and repeat the process on the second Head Light Panel.

### Focusing the headlight

Before mounting the Head Lights in the cab, the Lamps must be focused. You will need two 1.5V cells connected in series to provide the power source. Connect the two wires from one of the Headlight Lamps to your improvised 3V battery. The Lamp should light. Hold the Head Light about two metres away from a wall and adjust the Focusing Nut for the smallest full circle of light (spot). Lightly tighten the relevant Grub Screw. Back off to about 6 metres and, if necessary, loosen the Grub Screw and modify the setting to obtain a spot. Re-tighten the Grub Screw and re-check the spot. If okay, tighten the Lock Nut on the Grub Screw and check again. Place a drop of red paint on the Nut and Grub Screw. Place a touch of silicone on the end of the Retaining Nut studs to prevent loss. Repeat the process for the other three Lamps.



A final look at the completed cab front. Note the control cable connected into the socket. Windows were left out intentionally.

### Fitting to the cab

Lastly we now need to offer the complete lamp assembly up to the locomotive. It should slide into the elongated slot fairly neatly. Once you have got one home against the front of the loco, spot through the four mounting holes, remove the lamp assembly and drill the four holes out with a No. 8 drill. Now to the tricky bit! — tap the four holes to 12BA. Be sure to use plenty of lubricant such as turps or a specific aluminium tapping fluid.

The headlight assembly can now be put in position and screwed up.

### Air signal pipe

We finish off the cab detailing with a little light work. Some time ago, we ran an air signal line along the top of the roof line and terminated it at the end of the full-width body centre section. With the cabs in position, we now need to extend this line on to the cab roof. Refer to Figure 47 and 48 for the locations. We used 1.6mm soft iron wire (but copper would be okay) cut and bent to shape and length. Lie the pipe in its correct location, butted up to within 0.5mm of the end of

the one on the centre section, then sparingly superglue the pipe in position. Do the same to the other end. Note that the pipes are not diagonally opposite; they are on the same side of the locomotive. This makes for easy cab end identification in the future.

### Air horns

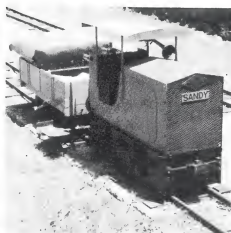
Two 5-chime air horn clusters are required for the locomotive. Scobie & Glover supply them as kits or already made up. For the construction and assembly of the air horns, see the separate article in this issue titled *Horns for 5" gauge diesel locomotives*.

### Body complete

This completes the body work detailing. Next we will return to the electrics for the auxiliary lighting.

To be continued ...

Clarrie's Place, continued from page 30



*Sandy* is owned by Steve Malone. The Malcolm Moore prototype is on display at the Nambour Sugar Mill.

Here we paused in the shade of a tree to stoke the fire and pump up the boiler. Then Ken stood up and said, "OK, you can drive it back!"

Assured by him that it was very simple, and having watched his actions for quite a while, I set off, gingerly at first, but with increasing confidence, finally blasting back up the driveway at a great rate of knots only to have to throw out the anchors when I realized I'd been switched into the siding!

Having safely parked the loco we adjourned for a welcome cold drink and more relaxing seat. From here I watched Steve Malone putting about on a delightful little diesel loco named *Sandy*.

### Driving Sandy

This being my wife's name, I figured I'd better get a photo of it! Grabbing my trusty camera I wandered over and asked Steve all about it. The prototype is apparently a 2 ft gauge Malcolm Moore shunting loco presently preserved at Nambour Sugar Mill. The model is powered by a 98cc Villiers petrol engine off a very old mower. Transmission is by a modified motor mower clutch and the controls are the essence of simplicity. Having explained to me that he designed it that way so that kids could drive it themselves, he stood up and said, "There you go, she's all yours".

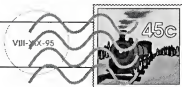
What could I do? I sat on and pattered away into the wide blue yonder, and kept going until I realized I was being slowly fried by the sun, when I called it quits and joined the general siesta until things cooled down a bit.

After lunch and a bit of a snooze, I wandered around the steaming bays and photographed some of the locos.

Neil Mackenzie was tinkering with his QGR B12 while young Jason Christopher was shunting up and down using Neil's A13.

In part two I'll describe some of the other locos and characters that gather at Clarrie's place!

# Letter Box



## Article thanks

Sir,

Congratulations to all associated with the publication of my article on the Double Acting Boiler Feed Pump (AME Issue 58 page 32). My special thanks go to Peter Manning on the presentation of the drawings.

The pump has been in operation now for three years and is working today without any repairs having been done or replacement of "o"-rings. Looking forward to the AALS convention at Townsville during Easter 1995.

Les Payne

Townsville Qld

## Memories of "Memories"

Sir,

The article *Memories of the Miniatures* in issue No. 58 by David Bourke brought back many memories for me. As a young lad, whenever the family visited Melbourne from the country I always made a bee-line for St Kilda to visit the miniature railway and over the years got to know the proprietor very well. He was a smallish man, not very robust and with a decided limp. Although I found him very friendly, I never knew his name.

In later years, when I was about 20, after two years' spare-time practical tuition by the engine driver at the local flour mill and correspondence lessons from the Melbourne Technical School, I was called up to sit the examination for first-class engine drivers.

This entailed attending the school each day for a week for personal tuition before the examination (and of course visiting St Kilda in the evenings).

On the day of the examination — after I had learnt that I had passed — I was going

through the gate to the miniature railway. The old chap hailed me with "How did you go?"

When I told him that I had passed, his next words were, "Well steam up — she's got a full glass of water and she's been oiled all round; take her away!" And that is how I filled in the afternoon: my first time in charge of an engine as a fully qualified, first-class steam driver.

I feel somewhat sad as I write this, as I was never to see my old friend again. As a turner and fitter with a full steam ticket in those days, when steam was the main source of power, I was always fully employed despite the Depression — so I did not get back to St Kilda for several years. When I did, I found the old chap no longer there and on making enquiries, all I got was a surly "E ain't 'ere no more" — and as David Bourke wrote in his article, the loco was minus the front bogie and was looking quite dilapidated.

On my next visit with my own kids, the whole kit and caboodle had disappeared, along with Kelly's steam merry-go-round next door.

I would like to know what became of the loco; also Dr Bush's loco, which I did see on one occasion, and a four-coupled engine that was working a carnival on a portable track at Mordialloc at one time. I would like to hear from any of your readers who may have any information on the whereabouts of any of these engines. I would hate to hear of any of them rotting away in some rubbish dump.

Alan Lee

Stawell Vic

## Alive and kicking!

Sir,

My good friend, Bob Moss in Perth, thought I'd like to see a copy of your excellent magazine, so he sent me a copy of your issue for Nov-Dec 1994. It's a fine magazine with interesting articles and very good photographs. On page 26, in the item on *Live Steam Conventions in Australia*, mention is made of the late Mr C.A. Purinton.

The writer of this article is a little premature, I'm afraid. Carl is very much alive and a sprightly 97 years young! He still rides 3½" gauge round level at his home in Boxford, Massachusetts. He had dinner with our mutual friend, IBL's Eastern Region Secretary, Bob Hornsby, just a few days ago. I had the privilege of meeting him and his son, Charlie, when I attended the Fall Meet of the North East Live Steamers in Nashua, New Hampshire, last October. It was one of the most enjoyable weekends my wife and I have had in a long time!

If our hopes go according to plan, my wife and I hope to make it out to Australia, in the

next couple of years, to see how you do things in your part of the world. It promises to be a very interesting trip! All the best from Canada!

Noel Tyler

Ontario, Canada

*Our apologies to Mr C.A. Purinton for this unfortunate error. I am sure that you will enjoy your visit to Australia if you have to opportunity to fulfill your travel plans...*  
bmc

## Centrefold

Sir,

Congratulations on a fine magazine. I am prompted to write after reading Issue 57 again. The centrefold picture is magnificent, like many others in the magazine. My request is: would it be possible for a regular wall poster type lift-out? I believe that you could get good publicity from such posters. I subscribe to the National Museum magazine and the posters received from the Museum, which I have displayed in my workplace, gain very favourable comment. Thank you for your efforts!

M. Callaghan

Maddington WA

*I am happy that you are enjoying AME. The centrefold may return from time to time given the right circumstances. I can't guarantee a regular insertion...*  
bmc

## Model loco development

Sir,

With reference to the What if, if only... articles and the replies of Messrs Bishop-Wear and Glover.

Firstly, as Mr Bishop-Wear points out, the railway industry is a business and should be run along those lines. However, it is a sad fact that many railways were reluctant to try any devices from other systems, or countries, simply because they were from other systems.

For instance, rocker grates were not fitted in the UK until very late in steam's history. But the savings, even with the good coal used in the pre-war years, were surely obvious.

The argument that the unions would not have agreed to the modified disposal times must be considered in the understanding that the disposal times (and many preparation times) were generally agreed to be impracticable by those who worked on them!

The fact is that the modern development of the steam locomotive was fragmented. The Americans developed the "machinery" side to a fine art and the French led the way thermodynamically. After the Second World War the French, with their 2-4-2 A1, started to apply American machinery ideas to French thermodynamics, and the result is history! The fact

## Letterbox Contributions

Contributions of letters by mail to PO Box 136 Robertson NSW 2577 or fax to (02) 646 1362 are very welcome.

As far as possible, AME is an open forum for all members of our hobby. Therefore, all expressions of fact or opinion — as long as they are not libellous — will be considered for publication.

Please type or clearly print your letters, as script is often difficult for the typist to interpret.

The Letterbox is becoming a popular medium of expression, so space will be limited. Therefore, letters of 400 words or less will have a better chance of being published.

bmc

that the two-cylinder loco in USA was stumped by a 16-cylinder contraption with millions of moving parts must denounce the myth of "make it simple". The diesel's superiority as a machine is the result of many years of development. Of course the American steam loco was superior in this respect to most others, but not because of any "simplicity". Is a roller bearing simple? Or self-adjusting axlebox wedges? Of course not!

So why were the Americans so willing to apply these labour-saving devices but not the thermodynamic improvements? It seems that parochialism played a great part! If a marriage of French technology and US reliability (not simplicity) had occurred, I am sure that the diesel invasion would not have been so complete, especially in those countries which did not have the resources to operate diesels as they must. Advocates in the UK at the time (i.e. E.L. Diamond) and the US (Lawford Fry) also encouraged an open-minded policy. It is interesting to note that both of these people came from the fringe of the railway industry.

Having said all this, however, I think that it was unfair of Ms Dennis to be so critical of individuals when the policies of the time were held so widely. It is also unfair to criticise Durrant, for instance, for failing to advise a country experiencing civil war to attempt to take on the development of "modern" steam locos: the fact is that according to Garratt Locomotives of the World, 1981 edn, that this possibility was discussed. It does not do her philosophy much service if she implies that one only has to read a few articles and a modern 21st century loco will somehow appear. This attitude cheapens the achievements of Chapelon, Porta, Giesl and many others. The road to technical excellence is a very difficult one — achievable, but only after a great deal of scientific development. Finally, I must agree that post-war steam development generally cannot be achieved by us, given the constraints of miniature live steam, including the temperatures and pressures used. But when we compare the models of today with those from the infancy of the hobby, I think we have come a long way!

Stuart Kean

Berowra Heights NSW

## Smokeboxes and Grates

Sir,

I am currently building a QGR A10 locomotive from Hobby Mechanics castings, advertised in AME. This has been in progress now for about a year, and most of the small bits and pieces are now made.

Two articles on smoke boxes and grates by Ted O'Brien (Issues 49 & 50) have interested me to the extent that I intend to incorporate the design recommendations into my A10. That this will mean lengthening the smoke box and frames (not cut yet) by 2½ inches is a little unfortunate, but as I have never seen an A10 in this area or in any other area for that matter I doubt whether anyone will notice the deviation from the plans. Since the tender has

been stretched by 5" to improve its water capacity, the addition of 2½ inches to the front end may well produce a more balanced appearance.

Now to the subject of this letter. Calculating the choke area from Figure 3 (page 22), given as 25% of the net area of tubes and flues, results in an area of 0.89 sq. ins., i.e. 1.06" diameter. Using the formula in Figure 1, the result is quite different. The A10 smoke box is 5½" diameter and as  $d = 0.21D + 0.16h$ , we have  $1.16 + 0.16h$  and if  $h$  is about 2" we have an area of approximately 1.5 sq. ins. — way outside the tolerance given in Figure 3.

Referring to AME Nov-Dec 1994, and page 20 in particular, the pipe on the left of Figure 4 is the air vent from the Edwards air pump, and is from the space between the pump cover and discharge valves, this also being the space from which the condensate returns by gravity to the hot well. My main memory of these pipes is the usually foul smell which they breathe over the engines with each revolution of the engine.

Another request: could we perhaps have an article on the painting of locomotives?

Obviously some of our members are highly skilled in this department and many others, like myself, who would like to be.

Thank you all for a very interesting magazine; I take pleasure in renewing my subscription and wish you all a prosperous 1995.

Tom Walker

Pearl Beach NSW

*Painting a Model Loco by Ross Bishop-Wear featured in the February 1990 issue of AME. It is available as a back issue: see our Back Issues listing on page 46...bmc*

## Cliff and Bunting tip

Sir,

The following suggestions may be of use to readers who are building Cliff and Bunting traction engines.

When boring the holes in the hornplates for the third motion shaft, open out the hole in the left-hand plate to be a clearance on the outside diameter of the ball race. If at any time the bearings need servicing, the whole shaft and bearings can be withdrawn from the left hand side without disturbing anything else. There is very little clearance between the crankshaft assembly and the two elbows on the top of the boiler, which takes steam to the manifold and the top of the gauge glass respectively. If the swivel nuts which attach these items to the elbows are made at least 25mm long, it is possible to use a spanner on them, which can be swung across the face of the boiler backhead. This applies particularly with a Briggs boiler.

Fitting a steady bracket from the top of the gauge glass assembly to the engine frame appears to lessen the chance of broken gauge glasses. If the top corners of the 10mm square blocks that are welded to the top edges of the ashpan are radiused, the ashpan will release

and hinge down from either side when only one retaining pin is pulled.

Hugh Carseldine  
Geebung QLD

## Barking up the wrong tree(nail)

Sir,

Maybe I am too much of an advocate for proper grammar in most respects (actually failed in English!), but I was very surprised to see the most interesting article on the — (shock, horror!) — "Bark" Endeavour. As I ever knew, the type of ship was called a "barque". Similarly, in recent times — even the staid old English publications now refer at times to the various forms of "verticle" steam engines! What happened to the vertical types?

I have also noticed in the Endeavour article, with regard to the upper photo on page 9, that the caption includes the word "trenails". I heard of these as a very young lad: Dad was helping a friend building a plank-on-frame model of cargo vessel, origin unknown. I am also unaware of its fate — it just seemed to vanish! I think it was explained that "tree-nails" were fashioned as pegs (or nails) from wood to use as fastenings, even before metal was used. The word shortened to "trenails" as I recall.

Well, for now I'd better have a nice rest and look forward to some very good (as always) issues during the coming year. I cannot praise your efforts enough. Also, I notice on the blue reminder sheet that NZ is quite apparent. To myself this is very mindful of the advert that I submitted in Issue 46 (Jan/Feb 1993), in which I asked whether any readers had copies of the old magazine Model Engineer in Aust. & NZ. I am still hoping to complete the series if ever possible. There are very good articles in the old magazines. If anyone needs information in this area, I could perhaps supply it.

I first attended "Exhibition Park" at 190 Parramatta Road, Ashfield on Saturday afternoon 21st September 1935. (More rest, Harry! — keep on the medication!) Sorry, but I could ramble on for hours! With apologies for all this discourse, I shall enclose my renewal subscription.

All best wishes and hopes for your continued success for 1995.

Harry Wiltshire  
Cowra NSW

*Thanks for your literary criticism, Harry — it shows that not everyone concentrates only on the numbers in AME! In addition to getting technical details right, we go to some trouble (except when production deadlines intervene) to apply a good standard of grammar, punctuation and English usage to the magazine. It's good to be challenged now and again!*

Clive Huggan, who carries out this final copy editing process for us, says: "I balked at bark too when I first saw it, but cautiously I checked the dictionary."

The word seems to come from a Late Latin or Old French (Old Provençal) word (both *barca*). It is recorded as having been spelt *bark* in English in 1475.

From 1601 it has been recorded as being spelt *barque* as well. The *-que* ending may well have been made popular during a fad for 'French' spelling in the 19th century, as evidenced by the US spelling — the Americans generally didn't follow the 'French' fad."

In the event, we decided on *bark*, which is also the Endeavour Foundation's usage. James Cook used *bark*, too: this is how he wrote it



bmc

## Garden railways and Mamod

Sir,

While I was delighted to see an article on garden railway in the Jan-Feb issue of AME, I was also dismayed by some of the information it contained.

Firstly, the Mamod range has been through many owners over the past few decades and the quality of manufacturing has varied considerably. At the very best, the Mamod 0-4-0 small-scale live steam engines can be considered as reasonable steam "toys", but the days of reasonable Mamod quality are long past. For the past several years, no Mamod products have been made at all, so any that remain on dealers' shelves will have been there for a long time. The standard advice among the small-scale steam community is not to buy one unless you have seen it running satisfactorily [or buy a mint one as a collector's item...bmc]

There is still a strong after-market in Mamod upgrade products, which can be used to turn a Mamod into a reliable and controllable steam model (as opposed to a steam toy), but in most cases the cost of the upgrades is higher than the cost of buying a new and properly engineered small-scale steam locomotive. Mike Chaney in the UK is probably the leading supplier of Mamod upgrade parts for anyone who is stuck with a stock Mamod that doesn't work.

Secondly, the Merlin company has also been through several owners and has suffered its own quality problems, so any particular Merlin locomotive may or may not be a worthwhile steam model. Merlin is certainly not one of the biggest manufacturers nowadays, and has not been for some years.

Roundhouse Engineering, as well as producing the Innisfail Tramway Fowler loco, also produce a wonderfully detailed Fowler tank loco based on a Fijian cane tramway prototype. It is typical of the types of locos used on Queensland cane tramways, and makes a nice companion to the Innisfail loco.

There are many suppliers of small scale steam locomotives, and a perusal of any of the generally available magazines which cover the topic, such as *Garden Railways* (US), *Outdoor Railroader* (US) or *Garden Rail* (UK), will provide advertisements from a range of suppliers. There is also a US magazine, *Steam in the Garden*, which is specifically for the small-scale live steam sector of the garden railway hobby. Most of these magazines are bi-monthly.

Thirdly, I don't know where Paul got the idea that the Sydney-based LGB and G Scale Model Railway Club of Australia has any dislike of small-scale steam models. Club members have a wide range of 45mm track-powered models, and battery-powered and steam-powered models using conventional control, command control and radio control. I have yet to come across a member's garden railway at which any of these power systems and control methods has not been welcome. For instance, at the January running meeting on the Hoslopps' garden railway at Warnervale, there were three small-scale live steam locos, one battery-powered loco and six track-powered locos in attendance.

Anyone with an interest in garden railways, in any scale, is always welcome at LBG&GSMRC meetings. There are now enough active garden railways among club members that most running meetings (every second month) are held at one of those railways.

G scale modellers may also be interested in the G Scale Society in the UK, which publishes an excellent quarterly journal and, similarly to the local G Scale clubs, has no hang-ups about the means of propulsion of members models. In practical terms, most G scale garden railways have fairly tight curves, as most G Scale narrow-gauge electric models will handle curves down to 600mm radius, so even G Scale railways built with more generous curves rarely strive for a minimum radius much beyond 2 metres. Many G Scale garden railways have adopted 1.2 metres as their minimum radius as this is the largest radius commonly available in Australia for turnouts from LGB, Peco etc. Most, though certainly not all, 45mm gauge small-scale steam locomotives based on narrow-gauge prototypes will readily get around a 1.2m radius curve. However, 45mm gauge locos based on standard gauge prototypes, such as most of the larger Aster locos, need at least 3.1m minimum radius and just aren't suitable for use on a garden railway primarily designed for G Scale operation.

Next, there certainly is one formal garden railway society in Australia. The Western Australia Garden Railway (WAGR) Club is a very active group which does an outstanding job of promoting the garden railway hobby in the West.

Lastly, for 16mm scale (1:19), "standard gauge" track would be 75.33mm, which is considerably larger than 2.5" (63.5mm) and I'm not aware that there is any consensus in

the 16mm community that it represents "standard gauge". However, 2.5" gauge does represent "standard gauge" for the classic, and largely moribund, Number 3 scale (1:22.6), which for all intents and purposes is identical to the modern G Scale (1:22.5). In practice, there is a very little interest in standard gauge modelling among the G Scale and 16mm communities, with the vast majority of activity focusing on narrow gauge.

It is amusing to note that 1:32 scale and larger is regarded as "large scale" by the model railway community and "small scale" by the model engineering community. I guess it all depends on your point of view. I certainly agree with Paul that more coverage of garden railways, in any scale, in AME would definitely be a "good thing."

Bill Bolton

St. Ives NSW

## Calendar?

Sir,

Firstly, has anybody had the idea of producing a wall calendar, which could cover 13 months or longer. With a little work from the AME, clubs could rent special months to promote their special day, e.g. Conventions, Inter-club Runs, birthdays etc., with a club print and information — and the appropriate day of that month could be coloured out. The calendar would be in front or on show in people's homes or workshops at all times.

I have now moved to Forest Hill in Queensland. The house we have bought is the oldest in the area and was on 800 acres. It had everything — cows, goats, horses etc. — and supported areas around Brisbane with food, fruit, cotton etc. We have 5½ acres in the middle of two 30-acre farms, and in time we will have a mini steam railway, where friends can drop in and have a run. We only have 200 plus feet of track to date. To AME: please keep the good work going!

Ron Chiddy

Forest Hill, Qld

Ron, we have considered a calendar, but not only does it show time, it takes time! If any club Publicity Officers are interested in Ron's idea, drop us a line. AME has Ron's address if anyone wishes to correspond... bmc

## Sounds like a 422?

Sir,

I have recently completed a 5" gauge hand trolley which has some resemblance to our new "Hunslet" loco at Babinda Sugar Mill. At least the paint scheme is similar. It was inspired by Ted Murrell's Flyer article in the early AMEs. I hope to write a short article on it soon.

To add to the make-believe I have fitted a control panel and a 12 volt gel cell to provide "diesel" sound and a horn. I was hoping the circuit for the diesel sound would be published in each issue covering the 422 class but this has not happened. A bit of searching around has found just what I need at very little

cost. Dick Smith Electronics sell a "diesel sound" kit for \$13.95 which is designed to fit into an HO scale loco and run off a pulse width modulator type controller. For an extra \$4.95 you get a 57mm speaker as well. My only problem now is to design a circuit around a tacho chip to convert pulses from a sprocket to voltage to drive the diesel sound unit. The DSE kit may be useful for the 422 project with a voltage divider input to reduce the 24v down to 12v DC. The circuit uses the power pulses through a bridge and filter for a power source. It uses the generated back-EMF of the motor(s) to vary the pitch of the sound. It also has a minimum setting so that after power is turned on the diesel sound "idles". I have not built this kit yet, and cannot advise the volume of the diesel sound, but if it is not so loud I'm sure an extra output stage could be added to drive a bigger speaker. In my case, the 2" speaker will be attached to a piece of 2" tubing to act as a resonance.

Peter Lukey  
Babinda, Qld

*Don't give up hope! The 422 sound story is coming. The sound system is an optional extra on the 422 so you are free to experiment. We decided to concentrate on the main construction first, in the meantime the prototype of our sound system has been getting plenty of use to ensure reliable operation. Our four watt 422 sound generator costs around \$15 to \$20 (not including speaker). The speaker is a good quality 203mm woofer, to bring out the deep throbbing sound of the GMS. In fact, on our 422, you "feel" the sound before you hear it! Those who have heard felt our sound system have given it their approval... bmc*

## More "Memories of Miniatures"

Sir,

I read with great interest the article on the 10½-inch gauge locomotive featured in AME Jan-Feb 1995. There was an article about it in the Model Engineer of March 1937. Here are details of the article.

"The above photograph and the one on our front cover are of a most fascinating 4-6-2 locomotive owned by Dr Hubert Bush of Melbourne, a railway enthusiast. This model possesses the mechanically beautiful and graceful appearance of the typical British railway engine, and Mr Mahony, the North Melbourne engineer, who was responsible for its construction, had in mind both the Flying Scotsman and the Victorian Railways Pacific S 300 which hauls the Sydney Express, when he designed it. It is in service on an ideal 10½-inch gauge garden railway over 400 feet in length, and the traffic on Saturday afternoons is particularly heavy. Recently an electric headlight has been added for night work.

"Principal features and dimensions are: type, Pacific 4-6-2; Walschaerts inside admission gear; pop safety valves and vacuum brakes; length including tender 12 feet 6 inches; height 28 inches; cylinders (2) 2¾" diameter by 4½" stroke; driving wheels 13¼"

diameter; and bogie wheels 7 inches; fire grate area 12 square inches.

The boiler was tested to 200 lb and has a working pressure of 100 lb. It is fitted with a Wootton firebox. The barrel is 11 inches in diameter and contains 32 flue tubes of 7/8" diameter. The fuel used is coke, and the eight-wheeled tender has a driver's seat and is equipped with a 20 gallon tank. The locomotive is capable of hauling two to three tons and has a maximum permissible speed of 20 miles per hour.

One of its many visitors was the Chief Commissioner of the Victorian Railways. It is said to be one of the finest models in Australia and its construction is considered as an outstanding achievement. — Guy Bakewell".

Aubrey Levingston  
Walcha, NSW

## Mystery loco

Sir,

Re Mystery Loco in the Nov-Dec 1994 issue, page 19. Dave Harper, in Steam Chest, had a photo of a mystery loco. In O.S. Nock's book *The Dawn of World Railways 1800-1850*, plate No 127 show a very similar locomotive. There are, however, some differences. The steam dome is on the centre of the boiler with no Salter safety valve, the splashplates are cut away to show the driving wheel spokes and the tender is a six-wheel type.

The following is a copy of the description given by the book *London and North Western Railway, Southern Division: Stephenson's Long Boilers 4-2-0*.

"After the formation of the London and North Western Railway in 1846, by amalgamation of the London and Birmingham and the Grand Junction Railways, the two main constituents remained very much apart for a time, with separate autonomous locomotive superintendents. To increase the "confrontation", which matters occasionally approached(!), the locomotives of the Northern Division were painted a sober green with very few embellishments — not to mention the Cornwell — while those of the Southern Division were a brilliant pillar-box red. So far as express locomotives were concerned, the LNWR types represented the highest and most successful development of the Stephenson long-boilered type. By putting the driving wheel at the rear and having the leading wheels widely spaced, a steady-riding engine was obtained without any of the yawing dangers that beset those locomotives that had all the wheels bunched closely together, as on the French Northern 2-2-2 and the Shrewsbury and Chester 2-4-0 which came to grief at Rednal. These LNWR 4-2-0s were large, powerful and fast engines with 7 foot diameter driving wheels and 15 ½" by 24" cylinders. Altogether there were thirty-seven long-boilered 4-2-0s on the Southern Division, though not all of these had driving wheels as large as the one illustrated."

R. Alchin  
Greenacre, NSW

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AUSTRALIA.





# News Desk

Compiled by Brian Carter

## AME Retail

Due to an expanding side of AME's activities, AME Retail is now being handled by Les Mouat as a voluntary activity. Thanks, Les, for taking on the task. We have a new mailing address for *AME Retail only*! If you wish to purchase items, particularly books, videos or calendars (not AME back issues) please send your order to: PO Box 355, Kooraling NSW 2650.

## New Zealand distribution

I had a bout of pleurisy in January, which not only delayed this issue, but also our intended release to New Zealand bookstores/newsagents. The New Zealand release will commence from the May-June issue. I hope this hasn't inconvenienced anyone.

I would like to thank Tom Hulce of Queensland for assisting me with typesetting for this issue.

## Reader's requests

A few readers have requested assistance.

A. E. Crawley of Queensland would like to see an article on a model of a River Murray paddle steamer, perhaps a small goods and passenger type. If anyone has built such a vessel perhaps they could come to the rescue.

While on the subject of potential articles, Mr Carlin of Queensland would like help in three areas: 1. pattern making, steam cylinders with cast-in ports in particular. He would also like to know which Australian timber is best suited to pattern making. 2. Metal cutting bandsaw blade repair, i.e., rejoining techniques. 3. Silver soldering/brazing techniques for attaching carbide tips to mild steel lathe and shaper tools.

Mr J. Hill has constructed a single cylinder steam engine of 1½" bore and 2" stroke. Mr Hill wants to put the engine to work on land, using a monotube type boiler: he would like advice on the water feed-pump arrangement required for such a set-up. If anyone has experience in this area and would like to help, you can contact Mr Hill through AME. An article describing a modern steam boat with a monotube boiler appeared in AME issues 18 to 26. Although the information is useful, the situations are different, hence the request for help.

## Subscription renewal security

Another reader expressed concern over the signature and card details when submitting subscription renewal forms. In case other readers share similar concerns, all credit card details are securely locked and used slips are burned.

## Steam-up 2000

It seems like long-range forecasting to some, but Barry Glover really needs to know if you are thinking about going on this ME

tour to Vancouver. See "Letter Box" AME Sept/Oct 1994 Issue 58 page 49 for details of the tour, or phone Barry on (042) 84 0294.

## Trade and commercial

A couple of big events from Hare and Forbes (new and used machinery merchants) are coming up.

### Brisbane, 24th-26th March

Hare and Forbes Brisbane, situated at 550 Kessels Rd, Macgregor, are holding their annual sale on Friday 24th, Saturday 25th and Sunday 26th March.

Of special interest will be a model steam display co-ordinated by Bribie Island MELSA. Other attractions will be a MIG welding demonstration, along with metal turning, milling, sheetmetal, tool grinding, wood turning and other activities. Visitors are assured of big discounts on Hafco and other products. Phone (07) 849 1888 for further details.

### Sydney, 4th-7th May

Hare and Forbes' annual four-day sale is on again at their Parramatta branch from Thursday 4th through to Sunday 7th May.

After the success of last year's inaugural four-day sale, the directors and staff at Hare and Forbes are once again, extending an invitation to the trade and public to attend this year's event.

Features: free admission and open all weekend. Free demonstrations of linsishing, welders, machine tools, wood turning, bandsaws, power tools, generators. Model engineering / live steam locomotive display by the members of Hornsby and District Model Engineers. Savings on a wide range of metal and woodworking machinery. Large range of hand tools. Sausage sizzle. Don't miss this opportunity to save on workshop machinery and tools.

### E. & J. Winter, Bolton Scale Models

E. & J. Winter have announced the release of drawings and castings for Russell Paynter's *Hit and Miss* engine that featured on the front cover of AME issue 50. Call them on (049) 51 2002 for further details. Earnest has a new ad in this issue, featuring his ever popular NSWGR 32 class loco.

### TOMM

*The Old Machinery Mart* magazine has new owners, and a new address: we welcome Mr and Mrs Wilson to the wonderful world of magazine publishing and wish them success in the continuation of TOMM. The first issue under new management looks great, with a colour front cover and the introduction of a full-page historical photo on the back. The inside format is largely the same as before with the exception of the introduction of mini-articles of vintage machinery. See their new ad

on page 50 for details.

### ARHS

The Australian Railway Historical Society — NSW Division — have moved, their new address is 67 Renwick St, Redfern. Phone/fax (02) 699 1714.

This division of the ARHS have released *The 1995 Guide to Australian Tourist Railways & Museums*. This excellent publication is invaluable for research or just knowing where to visit the nearest steam joint while on holidays. It is a bargain at only \$9.95 at most newsagents, rail hobby shops or direct from the ARHS.

### TEECE Engineering

On the subject of moves, TEECE Engineering are now located at Unit 3, 1 Rosella St, Frankston 3199. The unit is at the rear of J. & A. Wilson Automotive (*Melways* 99 D11). TEECE manufacture special purpose machines, tools, jigs and fixtures. They also do one-offs, prototyping and small batch work, engineering patternmaking, general and precision machining. They manufacture miniature steam locomotives to order.

## Steam Power news

We have been receiving a marvellous newsletter called *Australian Steam Power — A Journal for the Steam Engine Operators of Australia*. I must confess that although it is good reading I wasn't sure how to present it to AME readers. It is not a club journal, rather it is a journal about clubs: full-size steam clubs. It didn't fit in the Club Roundup section and it is predominantly prototype anyway. However, the last issue I received — Dec 1994 / Jan 1995, No 11 — is the final in its present form. The editor is changing the format from a photocopied newsletter to a professionally published magazine. The magazine will shift from a quarterly to a bi-monthly, I think it will be in AME's off month (I hope!).

ASP covers traction engines, steam rollers, the occasional steam lorry and a lot of paddle steamer news; there is even steam railway information. In fact, if it runs on steam, they'll talk about it! Like AME, they rely on readers and clubs for information about the current state of affairs in their field of interest.

## UK phone number changes

There has been a lot of news around lately about the change-over to an eight-digit system in Australia. Are you aware that the UK phone system has changed? From April this year, all United Kingdom STD code numbers will be preceded with a 1, e.g. (332) 83 0811 will become (1332) 83 0811. Dialling from Australia would now be 0011 44 1332 830811 (phone number for Traditional English Traction Engines).



## CLASSIFIEDS

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(Also See ad on page 7)

### 7 1/4" gauge C17 For Sale

- Steam loco in excellent condition, Queensland Rail C17 4-8-0 *Brown Bomber*. \$18000 Phone Peter on (07) 881 0512

### CLOSING DOWN SALE

- All items of Riverina model fabrications to go. Loco casting 7 1/4" and 5". Main item 2HP Osaka turret mill single phase with all tooling P.O.A. Contact Ray Catts before 20th March or after 20th April on (069) 22 3540

### 7 1/4" Gauge HUNSLET Loco for sale

- No. 1904 Powered by Suzuki LJ -50 3 Cylinder/Hydraulic Swash Plate Combination. Built 1985. Described in "Model Tec" July 1986, Page 18. Complete with Articulated Twin Riding Trucks - Hydraulic Braking \$6,000 o.n.o. Business Hrs (08) 259 5514. After Hours (08) 287 0970

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### FOR SALE American Live Steam Magazines

- Also Tools, Vernier Height Gauge, Decimal 1" - 4" Micrometers, etc. Phone evenings for list R. Schneider (03) 752 4065

### FOR SALE 7 1/4" gauge Heidi Steam Loco

- 2 years old \$5000 o.n.o. PH (07) 345 3846 Mrs Worsman

### 3" Scale Allchin Traction Engine

- part constructed, 31 castings most machined 7" steel boiler barrel, smokebox, side plates, gears, drawings. Book, gears, lots more, \$2,200 PH Syd Collie on (07) 36 2494

### 5" gauge 421 Class

- Petrol mechanical in very good condition with driver's truck and extinguisher \$6500.00 Jeff Barker (074) 42 9413

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### For Sale — set of castings

- All gunmetal, 5 1/2 kg for steam engine, osc, mid 1800's style, 7/8" x 1 7/8", 7" Flywheel, instructions, \$175. K.J. Charlton 70 Pennynes Hill Rd, Hackham, SA, 5163 (08) 382 5429.

### For Sale — Blowfly loco

- 5" gauge Blowfly locomotive 0-4-0, boiler as per AME Sept 1989. Hardly run. Strong loco, \$2,400. Tel (03) 819 6540.

### WANTED — Diesel Loco

- For commercial use. 12" Gauge. Must be in good condition.  
J. Fekete, Lot 2 Main Rd, Aberfoyle Pk. 5159. PH (08) 270 5800

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**Test Boiler 4"** all fittings \$350. Boiler 8" x 28" on wheels suit portable engine \$350 Not built to AMBSC Code. Jack (075) 31 3101

**5" gauge C38** complete set, castings wheels and trailing truck machined, copper boiler 85% complete, stays & bush's ready, includes drawing, etc., frame materials \$5200.00 o.n.o. Scott Robertson PH (02) 587 2507

**NSW D55 in 5" gauge** Approx 7 1/2" complete. All casting supplied, most machined with driving wheels in frames. Many other parts & drawings. \$1600. Phone Colin on (07) 207 2030

### WANTED

**Working steam turbo** in 4" scale for 7 1/4" N.G. Locomotive Contact Howard Wake RMB 259, Margaret River, WA, 6285, (097) 57 4587

**Patterns or castings** for a 3" Burrell Traction engine I will pay for all expenses. Colin Stanton PH (03) 578 8791 or FAX (03) 529 4248

**Saddle and Cross-slide** for Pultra Watch makers Lathe can adapt other types if necessary Don Cottrell (07) 356 1759 Brisbane QLD

**Shaper 8" or 10"** Douglas preferred. Must be in good condition. Single Phase. Phone Sid Wetton (02) 449 6580

**Wanted, Slotting head** to suit senior horizontal mill. D Sanderson 37 Plantation Ave, East Brighton Vic. PH (03) 592 9837

**Plans, drawings or information** for the "General" Please phone Cliff (02) 637 7217 or write Box 401 Merrylands NSW 2160

**Model Engineers' Journals** #5Jul/July, #6Aug/Sept 1991 and *Fine Woodworking* #24Sept/Oct, #25Nov/Dec 1980, John Snowden (02) 958 7214

**ICS (International Correspondence Schools)** reference books wanted and for sale. Colin Wear (049) 97 4838

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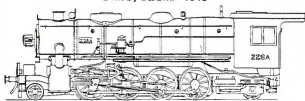
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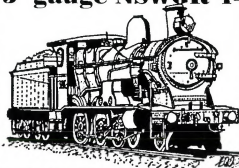
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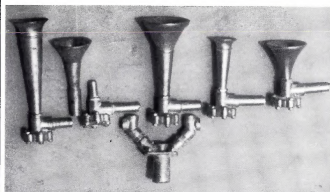
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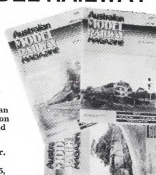
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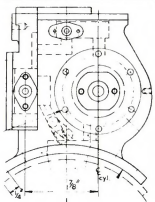
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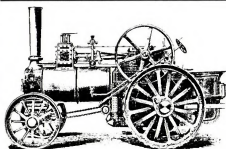


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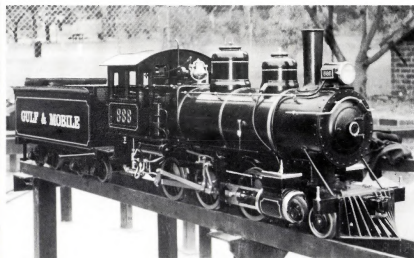
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